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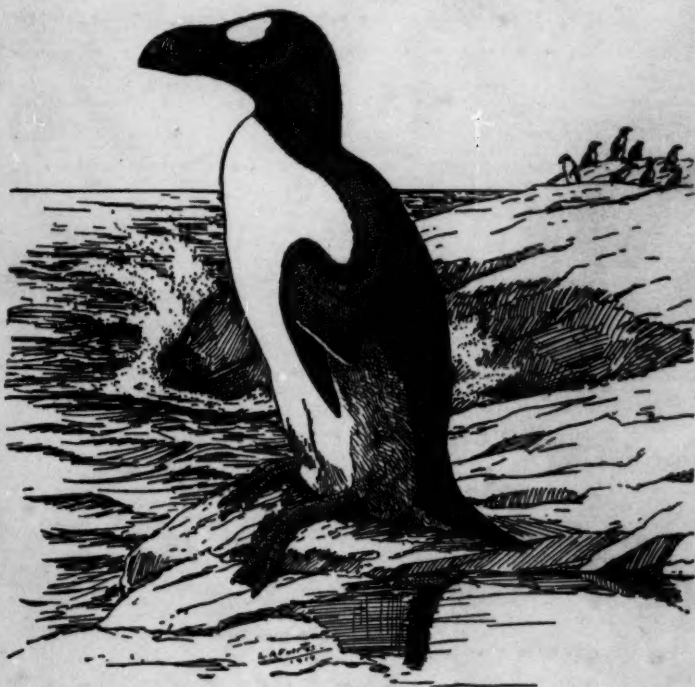
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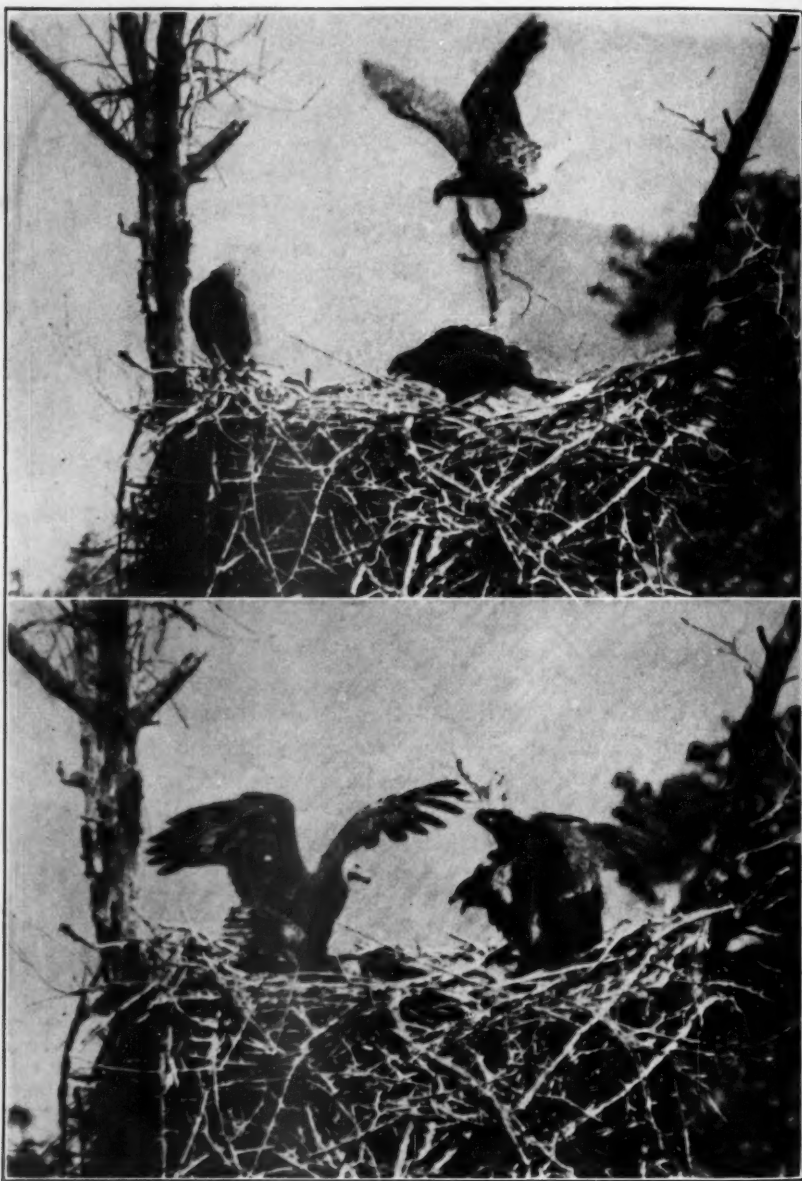
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1. FEMALE ALIGHTING ON STUB-PERCH: EAGLET BELOW HER WITH STICK IN ITS BILL.

2. FEMALE HAS LANDED WITH FISH: EAGLET RESPONDS WITH RAISED WINGS INSTEAD OF CROUCHING AND SPREADING.

THE AUK:

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THE DAILY LIFE OF THE AMERICAN EAGLE: LATE PHASE. (*Concluded.*)

BY FRANCIS H. HERRICK.

Plates XXIX-XXXII.

VII. BRINGING LEAVES, STICKS AND MATERIALS OTHER THAN FOOD TO THE EYRIE.

THAT the Eagle on certain occasions brings to the eyrie a motley array of grass, stubble, leaves, sticks, and whatnot, in place of food, is a curious, and at first sight rather puzzling fact; but the records of behavior in this and related species are suggestive if they do not afford a key to the puzzle.

The records for the American Eagle can be given briefly as follows: June 22, 1922; 5.47 A. M. A large cluster of oak twigs, bearing green leaves, was brought to the eyrie and at a time when the larder was far from empty, two fish having been twice delivered that very morning, at 5:24 and 5:27 o'clock. There was the usual excitement attending the arrival of the parent, but the leaves failed to arouse any interest in the Eaglets, and what were presumably their shrivelled remains were found when the nest-tree was ascended on the twentieth of July.

June 23. An old Eagle arose from the field directly north of the nest-tree, and but a few rods away, bringing in her talons a bunch of dry grass and stubble with a plentiful mixture of dust; the young, now hungry and excited, tore the mass apart with their beaks; and jumping on it and clutching it rose with parts of it in

their talons; the old bird simply dropped the mass and hurried off. No previous visits with food had been recorded for that day.

June 16, 1923; 5:56 A. M. As already noticed, at this first visit of the day a cluster of twigs of the pin oak, bearing green leaves, was deposited on the eyrie, but failed to excite anything more than languid curiosity in the Eaglets, who only casually pecked at them or tossed them about in play.

Macpherson's¹ experience with the Golden Eagle was in some respects similar; at half past seven o'clock one morning the female entered the eyrie, rearranged a few sticks, whose positions he had altered, and departed; in a few minutes she was back with a large stick, which was carried in the beak, and having placed it she proceeded to give the nest a thorough cleaning, removing successively a bunch of heather and old skeletons of hares and rabbits with other refuse. Again, when the Eaglet was a month old, and "infuriated" by long fasting, his mother brought in her bill a bunch of heather, and deposited it beside him, while shortly after she reappeared with a mass of coarse grass which was duly laid upon the ledge. "The Eaglet," said the writer, "was still crying for food, and it almost seemed as if she were trying to appease him by offerings of heather and grass. Probably, however, her real object was to rebuild the nest, which had become quite flat from the continual trampling of the bird's feet. This interpretation is hardly adequate since the observations were not continued long enough to ascertain whether such actions were ever carried to a conclusion. It might be that cleaning the nest, which involves the removal of various objects, is linked with a tendency to replace them with the result of spreading a fresh bed for the young.

Before considering the case of the Eagle farther it will be instructive to examine the equally striking and analogous behavior in Hawks. Allen² found that the Ospreys at Plum Island occasionally brought in masses of wet seaweed, which it has been suggested might assist in keeping the nest cool, but the more recent and detailed observations of Abbott³ show that such a cooling theory

¹ *Op. cit.*, pp. 26 and 36.

² Charles Slover Allen: "Breeding Habits of the Fish Hawk on Plum Island, N. Y." *The Auk*, Vol. IX, pp. 313-321. New York, 1892.

³ Clinton G. Abbott: *The Home-Life of the Osprey*. London, MCMXI.

will have to be abandoned. Except from incidental wettings in rain the water supply of young Eagles and Ospreys comes solely from their food. Abbott records that at 7:40 A. M., when the Ospreys were two-thirds grown, the female brought a stick in her talons, and slipped in with it while the observer's attention was directed away, but she was not seen to place it.

A nest of the Red-tailed Hawk, which I once examined early in June, in New Hampshire, contained two young with heads still capped in gray down; and lying beside them, to my surprise, besides a half devoured frog, was a fresh spray of hemlock bearing green cones; hemlocks were all about in the woods, and in fact one of the young Hawks, which was frightened at my approach, jumped out of the nest, and in falling caught in the branches of one of these trees, where it hung, head downward, until shaken to the ground. What use the hemlock might solve in a family of half grown Hawks I could not comprehend, but in the following summer the mystery seemed to have been solved by an examination of the regurgitated food-pellets of a family of the closely related Red-shouldered Hawks. The rejected pellets, besides containing bones, feathers and hair, were composed of the half digested leaves of this evergreen; so it was suggested at the time that the young Hawk might take its "bitters" in this form. Remembering the case of the Hawk I made a microscopical examination of the food-pellet ascribed to the Eagle and noticed in the preceding section; it proved to be a felted mass of small leaf-fragments, vegetable fibers and the hairs of various small mammals which I did not identify.

It is certain that the Eaglets did not eat the fresh oak-leaves brought to the nest by their parents, and that Hawks will devour the foliage of a conifer must be regarded, I now believe, as a purely incidental occurrence, since when hungry they might be expected to test and taste anything available in the nest. Whether the leaf-fragments in the Eagle's pellet were primarily taken by the eater or the eaten cannot, of course, be definitely known; though if young birds will swallow leaves old ones might perhaps be expected to yield to the same temptation.

By the process of exclusion we seem to be brought face to face with at least two questions,—whether the strange acts described

represent only a recrudescence of the tendency to freshen the nest which, as I have recently ascertained, is very marked in the American Eagle at an earlier time when its young are about two weeks old; or, whether in such acts we see only a freak of emotion on the part of the old birds, acts which are thoroughly incongruous with any end to be attained of which the field of behavior could supply many examples.

A fairly plausible case could be made for the latter view; there is normally the strong impulse to hunt and seize the prey; and having seized it there are conflicting impulses to satisfy their own immediate hunger or to carry it at once to their young. In this struggle of impulses one usually gets the upper hand; but an Eagle will sometimes compromise by eating part and bringing what remains to the nest. Now when the impulse to seize is strong as ever, and for the time prey is lacking or for any reason they fail in their quest of it, the bird might seize any convenient object, a stick, leaves,—anything. If the distance from the nest be great we should expect that the object would soon be dropped because the original impulse would not then be reinforced by the sight, “feel” and perhaps taste of prey. Were this the case many sticks, bunches of leaves, grass and the like, would be seized only to be dropped long before they reached the eyrie because of the lack of that reinforcement to which I have just referred. If we look for an analogy we might possibly find it in the behavior of an old Eagle at the nest, as earlier noticed, when she had the impulse to feed on the prey which she had but recently brought. She advanced towards it, but an Eaglet was already in possession and warned her off. What did she do? Still acting under an impulse to seize, but which was not strong enough to cause her to dispossess the youngster, she grabbed a stick and dragged it about. Emotion had to find an outlet, and a stick was ready at hand, but the stick was not taken with an “object in view” any more than were the bunches of oak leaves which were tossed on the eyrie towards the close of nest-life.

Whether such acts as we have here described represent a fading or dying instinct exclusively,—the echo merely of an action which comes into full play at an earlier stage, or whether they are mere freaks of emotion, in support of which we have only uncertain

analogies to offer, cannot be decided until continuous studies have been made upon the whole life at the nest.

VIII. ACTIVITIES OF YOUNG EAGLES.

The activities of the Eaglets at the nest proved quite as interesting as those of the old birds since they show us in nearly every case the model in simple form on which heredity has molded the behavior of the adult. Aside from preening, the major activities during the last month of life in the eyrie center about feeding, mutual response, or their reactions to one another and to the parents, flying exercises and play, the last two being related at many points.

On May 31, 1923, I was considerably disturbed upon finding only one Eaglet in the nest, and on June 11 when we erected the tent-blind, and scrutinized the top of the eyrie with particular care, still but one bird could be detected; when, just as we were trying to resign ourselves to so serious a loss, and the carpenters had arrived to make some necessary changes, suddenly the missing bird arose, like a Phoenix from its ashes, and stood upright on the nest-front. The Hawk mentioned in the previous section as having bolted from its nest and, in falling, having seized a branch to which it clung suspended until shaken off, was back again in its place on the following day, having been returned, no doubt, by its parents; but the Eaglet had not fallen from the nest; it had probably found a depression in its ample top to which it could retire and remain for hours perfectly concealed.

From the first of June onwards the young Eagles became daily more acute to their surroundings, more strenuous in their play and more bold and masterful in all their actions. When their eyrie had been explored for the hundredth time they began to take perches along its edge, and they would then gaze at objects on the ground and peer into the sky; not only would they detect their parents when coming from a distance with food but also when high overhead. If hungry they never failed to make known their desires by their peculiar cries while their heads would be extended eagerly in the direction of a parent whether approaching or leaving the nest. The hum of the mail-aeroplane, which twice daily passed

their nest-tree and often high above it, seldom failed to attract their notice no less than did a true bird even if not larger than a Swallow.

The various activities of the young, like those of the adults, are more or less chained or interlocked, which is characteristic of instinctive actions generally. A bird that had been feeding would often jump sidewise to the margin of the nest and begin to flap its wings, a first step in the flight-exercises, and after keeping this up for a minute or more it would pause for a few seconds; then, raising the hinder part of its body with the head correspondingly depressed, it would "shoot" over the side (Pl. XXXI.). Muting usually followed feeding, as in other birds, and the excreta being liquid do not commonly foul the nest, but when favored by the wind may be shot for a distance of twenty feet until a whitened circle is formed about the nest-tree below.

In such flying practises the Eaglet often exercises its feet by a treading or trampling movement, and after grasping sticks, sidestepping and prancing about it may bring such a *tour de force* to an end by a broad jump to the side of the nest, there to settle for a period of rest broken by the ever recurrent attentions to its toilet. Such activities commonly last from two to five minutes, and it sometimes happened when one reacted promptly upon the other, or when both were simultaneously stimulated by the wind, that they were flapping and jumping together and the eyrie then presented the liveliest scene.

When the young are not hungry they manifest little excitement at the parent's approach and if a fish is landed they will only peer or peck at it rather gingerly; there is no eagerness, no squealing, no seizing the prey and spreading over it, the customary response which only hunger can evoke. Indeed, on June 22, a record day of the present season, when the old Eagles had eight fish to their credit, the young were so thoroughly sated that once nearly an hour passed before either bird ventured to touch the food. The flapping which commonly precedes the act of muting may sometimes follow it and at intervals of every few seconds, to be ended, perhaps by clutching and treading the prey even when it has already been reduced to bare bones.

We often watched the behavior of the young Eagles at the dawn

of their active day, and though never quite uniform it was always essentially the same: the following account is transcribed from Mr. Myers' notes: on June 15, 1922, he reached the base of the ladder at 3:30 A. M., while it was still dark and a Screech Owl was calling in the woods. Upon making the ascent an object could be dimly discerned at the far side of the nest; but as the light increased this was gradually resolved into the two Eaglets, which were standing close together with bodies apparently touching, and dozing if not sound asleep; they were perched on a stick at the margin of the nest and were facing outward. Suddenly at a few minutes after four o'clock they seemed to awaken and moved a few steps apart, with backs to the observer, as before; then the bird on the left began to flap its wings until it faced west, when the other also turned, such fortuitous movements bringing them in tandem, one directly behind the other, and standing thus they continued flapping for four minutes together; this exercise over, one of the Eaglets walked up to a carcass of the previous day and began pulling at it with its bill, and after renewed flapping it muted over the side of the nest. After a brief pause the stretching and flapping began again, to be repeated at minute or half-minute intervals, until they finally came to rest; in twenty minutes from the time of awakening both Eaglets were standing close together and in the same place where they were first seen.

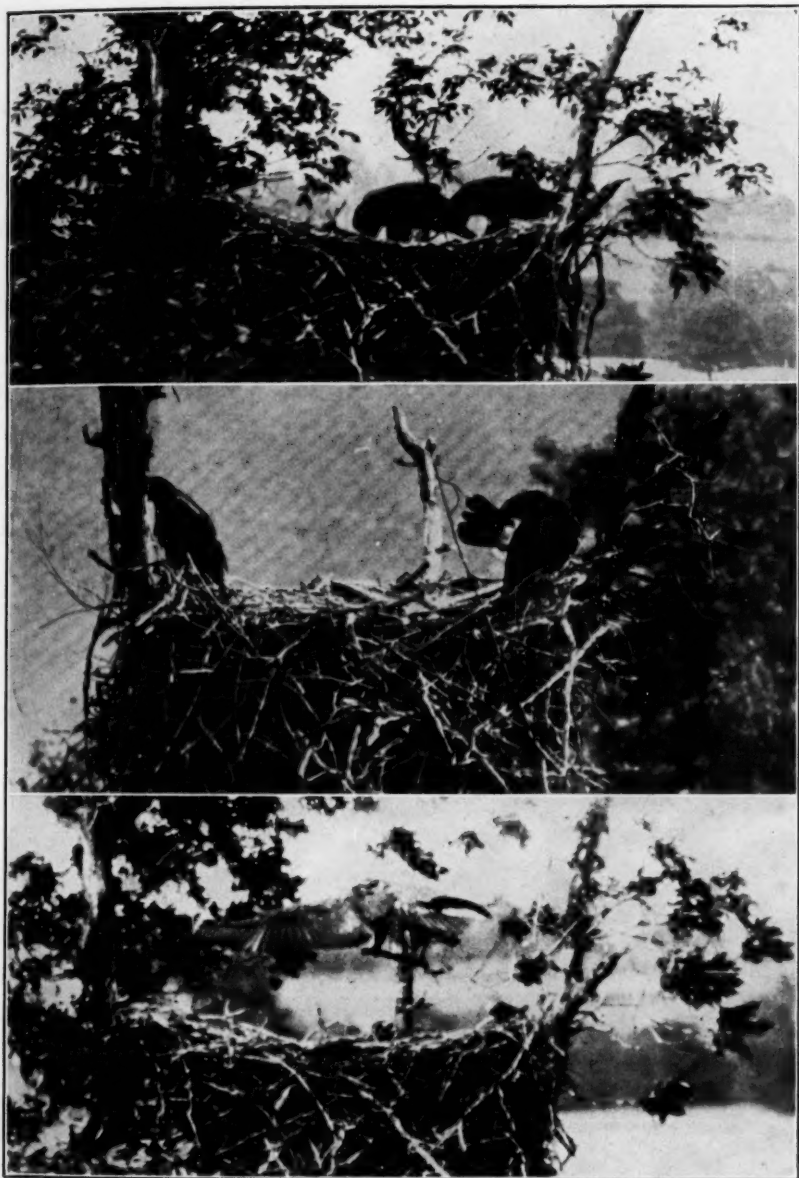
At 4:20 A. M., before there was enough light for reading, one of the young Eagles began to preen and ten minutes later, while the other was trying to extract some nutriment from the bones of a fish, it started upon a lively tour about the eyrie, jumping and flapping; and now the feeding bird, as if stimulated by its nest-mate would occasionally pause, flap its wings and go through the characteristic treading movements with its feet, much as in later life all Eagles do when rending their prey. At 4:45 o'clock one of the youngsters began to caper around with the wings raised above its back, as when held in readiness for immediate use; with a broad jump it cleared the eyrie from side to side and upon landing knocked down so many loose sticks that they fell in a shower to the ground.

Shortly after the sun's disc was clear of the horizon, at 5:05 A. M., Bob-white gave his first call in the fields below, as if to tell

the world that he was also awake; meantime both Eaglets lay flat in the nest, and so quietly that a querulous *yeeep* but rarely escaped them; for over an hour they were hardly seen to move, and were not aroused by even the scream of one of the old Eagles who at this early hour reconnoitered the nest and then moved off to the southeast, probably to resume its perch. Shortly after six o'clock one of the Eaglets stretched first his right then his left wing, the other following suit while still lying prone; after a further brief rest one and then the other jumped up to enter upon the next flying exercise of the day, which likewise ended in muting and rest.

The Eagles' larder was now empty, and both Eaglets peered curiously about, now and again turning an eye skyward, as if looking for their parents; one was seen to stoop, pick up something in its bill and pass this bit of material to its nest-fellow, which received it quite as it would take food from the bill of an old bird; it then *yeeeped* like a young chicken and, as if overcome with ennui, yawned. Such querulous notes are a sign of uneasiness, but not necessarily of hunger, for after having uttered them continuously for over twenty-five minutes I have seen a bird walk up to a fish, which had been lying on the eyrie in plain sight, and tearing off pieces of the flesh, swallow them with evident relish; but when hunger is intense or the excitement is greatest, such calls pass with rising inflection into a squeal and at a later time into a shrill scream. Quite often the "yeeper" will be seen to pause, and if stirred by a contrary impulse begin to preen or proceed to examine other small objects in the nest. We have also heard a peculiar chuckling note from the young and also, as we thought, from one of the adult birds when perched in the grove.

Thus the round of aquiline activities, beginning at dawn, proceeds through the long summer's day, all actions, as we have seen, being more or less linked in serial fashion, with constant repetition, but with endless variation in all the minutiae of detail. Certain of these acts, as in particular the flying exercises, gain fuller expression from day to day, so that however stereotyped any given performance may appear, complete uniformity is never realized. One Eaglet frequently reacts upon the other and occasionally both will respond simultaneously to the same stimulus, whether it be the parent, the sight of prey, hunger, heat



1. COMMON FEEDING ATTITUDE, BUT UNUSUAL IN SHOWING BOTH BIRDS
FEEDING AT THE SAME TIME.
2. BIRD ON RIGHT DRAWING BILL OVER INDIVIDUAL TAIL-QUILLS.
3. EAGLET PLAYING WITH MOCK PREY; FLYING UP WITH STICK IN ITS
TALONS.



or the wind, but it rarely or perhaps never happened that both would begin the jumping and flying practices at precisely the same time; and since the internal states of any two birds for the moment at least can hardly ever be the same, we should expect to find an alternation or an overlap in all their major activities. It was common for one bird to begin a period of exercise and be followed in from three to five minutes by the second; one would take food and a little later its fellow would follow suit, and while there might be an overlap in these operations it was quite unusual to see the two birds feeding simultaneously; accordingly the "forbearance," so often exhibited by one Eaglet when the other is spread over the prey must be set down as due in part to a difference in their internal states; when, on the other hand, hunger is keen in both and no other factor interferes, a struggle over the prey is inevitable and this happened from time to time.

Preening must certainly be rated as a major activity, and the instinct responsible for this act is on hand in some of our altricial birds before a single feather has appeared on their bodies. On May 10, 1922, the two Eaglets when at the age of about three weeks were in gray down stippled with the brown contour-feathers, and their hazel eyes and dusky bills still gave the head that dark appearance so noticeable at an earlier age. They kept to the center of the great nest, spent much of their time in preening when not lying down, and though awkward on their feet, they would occasionally rise, stretch and slowly move their wings, the quills of which had emerged to about half their normal length. A week later, when a month old, their heads were still gray-capped, but the whole body was freely sprinkled with the sprouting contour-feathers and the wing-quills were well advanced; while we watched them they were nestled close together on the eyrie, and would rise to work their wings, or bill and peck each other in a friendly way.

At this stage preening was the order of the day and for a week or more the young "bird o' freedom" presented a most ragged and disreputable appearance. When thus actively engaged, and with the eyes often closed, the light down was sent flying to the breeze; gray fluffy sprigs of their natal covering were clinging to all parts of the nest, to neighboring trees, and when the wind

was right at a later time, some of it even floated into our tent. A pair of House Sparrows, which were then nesting in the side of the eyrie, were most diligent in collecting this treasured down, and in early June one would see these little vagabonds steal up to the edge of the nest, snatch a few coveted sprigs and hurry back to their retreat. They seemed to have an unnecessary fear of the Eaglets, and only once did I see a Sparrow tarry long enough to pick up a few scraps of food. At another time, however, the bolder Red-headed Woodpecker alighted on the eyrie and freely helped himself.

At the five weeks' stage (May 24), the brown juvenal plumage was fairly well developed, though strands of gray still lingered in the less accessible parts of the head and neck; but the preening process still went on apace, and seemed to gain momentum with the passage of the days, for there were abundant stores of down below the surface yet to be routed. This process, so important for young and old, as the life of each plumage is short at best, must go on, not only to the time of flight but to the very end of life itself. When the sixth week has been attained the Eaglets are brown all over and sleek as a new silk hat. The top of their eyrie by this time has been trodden quite flat and its sixty square feet of surface offers an excellent arena for the exercise of their growing powers. In making their toilet at that age the young Eagles usually preferred a perch at the edge of the nest, but in 1923 the nest-perch eventually became their favorite station; and thereon for a number of days we watched the *repertoire* of these contortionists, as they diligently combed over their wings, spread the tail-fan at right angles to the body (See Pl. XXX.) and ran the bill over each quill in succession, from base to apex, with the well known vibratory movement of the mandibles; or, pressing the oil-gland with the bill they proceeded to anoint the body and indirectly the head by rubbing it on the parts already treated. The operation was frequently brought to a close by partially erecting the feathers and shaking them out (See Pl. XXXI.) and when on the nest they would raise the wings and take a jump or two, the more effectively to dislodge the last sprigs of loosened down.

In stretching, the wing of one side is spread out to the full, but the corresponding leg, instead of moving simultaneously as in a

Gull or Crow, lags behind and the toes are clenched. They will sometimes stretch a wing when lying prone as if too indolent to rise and it may be some time before wing and leg of the opposite side are put through the same exercise. The Eaglets doze or sleep intermittently throughout the day, grasping some firm stick as they stand on the edge of the nest or lying flat with the head down, and the eyes may close but are certain to open at frequent intervals; they like to stand or lie close together, and the direction of the wind can be exactly gauged by their position, for they always face it.

We have spoken of the variation to be noticed in the nesting scenes which the following incidents, concerned mainly with the feeding habits of the young, will serve to further illustrate: June 27, 6:58 A. M., a half-plucked chicken was brought in by an old Eagle, who remained less than a minute and departed for her perch; both Eaglets crouched and clamored lustily, but only one of them seized the fowl while the other was romping about and flapping its wings; this one clutched at sticks, pecked at them and more than once attempted to secure the appropriated chicken. After a repast of a quarter of an hour the first Eaglet gave way to the other bird which laid hold of the prey with one talon, dragged it aside and set to work; not feeling satisfied, however, the first bird went after the chicken again, but was immediately warned off. For two minutes they stood, with wings raised, facing each other, like fighting cockerels, until the bird which had taken first chance by an adroit thrust snatched the chicken with one talon and, dragging it to the opposite side of the nest, began treading it with both feet; after each hasty mouthful it glanced around to watch its nest-mate. The robbed bird stood still, as if dazed, for some moments, and after having flapped a few times settled down to watch for another opening; with lowered head it moved very slowly towards the feeding bird, following its every movement intently, and now an interesting thing happened: the Eaglet that was feeding tore out pieces of the flesh and intestines and thrice offered them to Eaglet number two who received them in bill and deposited them at his feet without swallowing a morsel. He was not to be thus beguiled, however; watching his chance, he seized the whole carcass and having deposited it beside the prof-

ferred pieces went to feeding in earnest. When sated with food the Eaglet will often jump to one side, wipe its bill on a stick and proceed to pick off any particles which may have adhered to its feet.

At 7:59 on the same morning, the female Eagle brought in another chicken, but cleaner plucked than the last; and while her young were crouched and squealing she flapped her wings eight or ten times, then hopping to the front of the nest fairly faced our tent, much of the time uttering a peculiar mewling or "yeeping" note, suggesting that so often emitted by the young; her mouth and tongue were smeared with blood and a few white feathers still adhered to her bill. Whether stimulated by this parental call or not, both Eaglets immediately pounced on the chicken and struggled and screamed over it for some minutes; when by a sort of mutual consent both had settled down to feed, we noticed that every moment or so they would throw up the head and glance about for assurance precisely like an old bird. On another occasion when both were feeding on the same chicken we saw one of them tear off a leg and try to bolt it whole, but failing in this it managed to disjoint and swallow it piecemeal. At a little later time the most eager or responsive bird, which was always first to seize the prey, would sometimes grip it in its talons and, as it had done many times before with sticks, rise with it five feet or more in the air; but this was possibly only an effort to make sure of the quarry for upon dropping back to the nest the bird would go to feeding at once.

On June 30, 1922, there developed a series of scenes apparently similar to those just described, but upon a close analysis they will be seen to differ at nearly every point. The female Eagle was bringing in still another chicken, and the young greeted her with shrill screams when she was a hundred feet away. For some unexplained reason she was in great haste and after dropping the prey she cleared the nest with a bound, came to attention for an instant on the opposite side and made off for a tree-perch. The two young stood close together, and with heads extended, gazed at their retreating parent, as if she were an unexplained apparition, but after three minutes had passed one of them attacked the chicken while the other began racing about, clutching at sticks

and furiously flapping its wings; then with lowered head it approached the feeding bird in a half serious, half playful manner, but only to make a feint at attacking, to sidestep and caper off again, reminding one strongly of two puppies at play; it then picked up sticks in its talons and rose with them in the air. Even the feeding bird was induced to pause at such extraordinary outbursts of activity and without withdrawing its feet from the prey, for full six minutes it watched its prancing, leaping, flapping nest-mate before resuming the meal. But the incident was not closed, for after ten minutes of this astonishing activity the attack upon the feeding bird was renewed, now less in the spirit of play; the bird in possession then spread over the chicken and pecked at the intruder whenever he came within reach. After eight minutes of give-and-take in this passage-at-arms the persistence of the hungry Eaglet was rewarded in being allowed to taste of the coveted food, and as the first bird withdrew he had the whole carcass to himself. To conclude, the satisfied bird went to the nest-margin and cleaned its bill, snipping off a number of green leaves in the process; a vigorous jumping and flapping exercise followed and a few minutes later it was peacefully napping with eyes closed and face to the wind. When in the course of ten minutes the second Eaglet had taken nourishment enough, he joined his fellow who was on the rim of the nest, and for one hour and thirty-four minutes they stood together, facing us and the camera, for the breeze was then from the south; meantime they might preen their feathers, drop a wing, or sweep the horizon or the sky by a turn of the head, but their feet, as if anchored to the perch, seldom moved.

When the Eaglets were lying down or standing together, if the spirit moved them, they would make friendly passes at one another with the bill and less frequently "bill" one another, when one would hold its head up to the other and their bills would remain in contact for perhaps half a minute or more. The "passing" is certainly play, but the "billing" has probably another origin, that of habit, engendered by a long course of receiving food directly from the bills of the parents. As in other nestlings, the Eaglet does not always discriminate, especially if hungry, and we shall see that it will often react to its nest-fellow precisely as

if it were the true parent bringing food; it will crouch before its companion, erect its feathers, hold up its bill and, squealing, beg for food. On still another occasion when both were feeding on the same carcass, one was seen to hold up its bill with a morsel of food as if about to swallow it, when the other reached up and took it; but if it were a case of stealing there was no protest. Such incidents might very well help to reinforce the billing habit when once established.

It was very interesting to find the young Eagles such excellent exponents of the theory and principles of animal play, particularly as defined and expounded by Groos,¹ the ablest and wisest student of this difficult but fascinating field. The young Eagle or Hawk that jumps on a stick, tosses it about, spreads over it or flies up with it in the air, is impelled by an irresistible impulse, precisely as is a kitten which runs after a rolling ball, or if no other object offers, tries to catch its tail. All such impulses, as Groos has convincingly shown, are favored by a superabundant store of energy and are premonitions of later and more serious activities; thus by exercising its powers in certain definite ways which are strictly determined by its hereditary equipment, does the young animal become their master, and when it is later required to use them with serious intent it will do so as a matter of course. This feeling of abounding energy finds expression in different animals in certain very definite ways, but the expression is similar only in those forms with like hereditary endowment. Thus, the Eagle and the Red-shouldered Hawk will seize a stick and spread over it in much the same way, but slight differences may be noticed; so far as I have observed, the Eagle covers the object less completely with its wings, sometimes not at all, and it may not spread the tail. Heredity, in large measure, determines all such acts.

A surplus of energy in the young animal is always a favorable condition for play, but it is not its direct or underlying cause; in demon instinct we touch the real fount and cause of play, and here as in so many other cases, the instinct anticipates the animal's serious needs. When the accumulation of nervous energy is such that some discharge of it becomes necessary, the instinct will be

¹ See Karl Groos. 'The Play of Animals.' Transl. by Elizabeth L. Baldwin. New York, 1898.

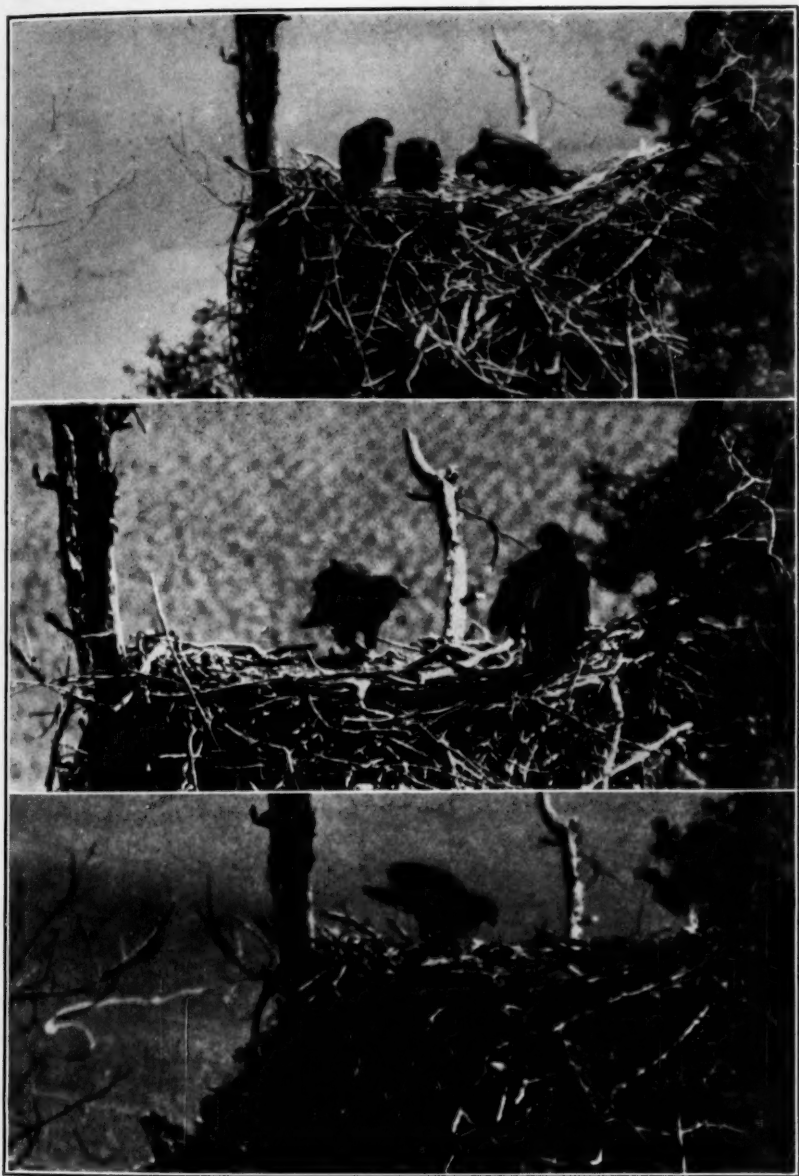
expressed at the slightest provocation; a stick or a clump of grass will stir the play-instinct of an Eaglet almost or quite as readily as a fish or any real food, just as the kitten seems to derive as much satisfaction from any rolling object as from a real mouse. Play is the parent, not the child, of work, and as Groos says, animals do not play because they are young, but are endowed with youth because they must play. The biological end of play is thus to fit the animal for the ready performance of those activities which will be most needed in after life.

We have already given a number of incidents which illustrate this instinct of play in the Eaglet, such as seizing and spreading over a stick or clutching it with both talons, flapping the wings in an attempt to rise with it in the air, which they will later succeed in doing to admiration (See Pl. XXX.); all clearly anticipatory of their later methods of dealing with actual prey; or, playing with leaves or any other small objects, gripping a stick with claws or bill and dragging it about, pecking or "passing" at one another with the bill, and the like. I once saw a young Eagle rise to a height of several feet with what looked like a piece of skin from a plucked chicken and one day Mr. Myers witnessed what might be described as a "tug-of-war," when both Eaglets seized the same stick with their bills and struggled over its possession. Again, when other convenient objects were lacking, I have seen an Eaglet pick up a white feather and a corn-cob and toss them about; at another time when one of the birds was jumping and flying up from the nest it landed squarely on the back of its companion, who was lying down, but only started a friendly game of "passing" or sham-fighting. The cases which have just been mentioned represent either "hunting plays," where the animal is dealing with lifeless mock prey, or, perhaps, "fighting plays," in which the tilts and rivalry between the two birds is of a friendly character.

The flight-exercises which become so marked a characteristic of late aquiline nest-life really begin quite early; their first expression is perhaps seen in raising and spreading the wings, with jumping later added, and with more and more vigorous flapping as time passes. After a while a simple routine is established,—raising the wings until they seem to touch over the back, taking a few strokes and jumping; the flapping gradually

comes to take their feet above the floor of the eyrie and at eight weeks of age they may be able to rise two feet or more in the air; this ability attained, they are liable to go higher and higher and in a fairly stiff breeze, which helps to sustain if not to stimulate them, they begin to soar and hover. In 1922 we said "good-bye" to the Eaglets more than once before knowing the long practise they required to produce that perfect coordination of muscles and nerves which was necessary for confidence in the air. During the last week of regular eyrie life in that year they would sometimes rise to a height of fifteen feet, and soar for a full minute, going even beyond the confines of the nest and always with talons down to facilitate landing upon their return.

In our first season with the Eagles the young seemed disinclined to leave their eyrie, and were finally starved out and lured away by the old birds. A single chicken only was delivered on July 1 and but one fish on the day following; the first Eaglet went off unobserved by us after noon of the second, but on July 3 the old Eagles thrice reconnoitered the nest with fish, showing it to hungry Eaglet No. 2, but without delivering it. On the morning of the Fourth of July, the hunger of the last bird having become desperate, the following action, as observed by Mr. Myers, took place in the course of about three minutes: at 5:15 A. M. the female Eagle appeared with a fish in her talons and, as she approached the nest, began to circle about it coming ever nearer and nearer. (The male, during this time, as was later ascertained, was perched nearby in the grove; Eaglet No. 1, which had gained its freedom two days before, was flying about, pursued by a King-bird, and tried repeatedly to take the tall east perch but without success.) At 5:18 as the old Eagle with the fish was circling just above the nest the Eaglet was jumping with legs rigid and flapping frantically; suddenly it leaped into the air, and for a second seemed to hang, as if poised over the eyrie; at that moment the circling Eagle began to scream, and swooping down at the hovering and now screaming youngster passed him within six feet; a minute later the Eaglet, still holding to the air, drifted fifteen feet or more beyond the margin of the nest; with vigorous wing-beats it began to move eastward, following the mother bird with the fish and made a full mile in its first independent flight; it finally landed in



1. FEMALE WHILE FEEDING STOPS TO SCRATCH HER HEAD: YOUNG WATCHING CLOSELY ARE LATER FED BILL TO BILL.
2. EAGLET ON NEST MARGIN TO RIGHT SHAKING OUT FEATHERS AFTER PREENING.
3. EAGLET ON LEFT 'SHOOTING' FROM MARGIN OF NEST. OTHER ONE LYING FLAT AND NEARLY CONCEALED.



the branches of a tree on the edge of a strip of woods and doubtless was there allowed to feed on the tantalizing fish.

The flight of the first Eaglet from the eyrie in 1923 was far less spectacular, owing possibly to the new conditions introduced in that year by the presence of a nest-perch. The preliminary hovering over the nest was less frequent also and the birds never rose to a height of over four or five feet. On the morning of June 27 I noticed that one of the Eaglets was flapping and moving about in its usual restless fashion; presently, at exactly 10:35 A. M., I photographed him as he had risen a few feet in the air (See Pl. XXXII.); and as I stooped to change the plate-holder, he went off very quietly and was seen perched at various points in the grove during the next two days. There was no starving or luring of this bird, food having been twice delivered before he left, at 5:50 and 7:28 o'clock in the morning and after his departure at 5:42 in the afternoon. His subsequent maneuvers and those of Eaglet No. 2, who was then at freedom, will be given in detail in the following section.

The young Eagles move about freely in the neighborhood of their nest after their flying ability has been proved, and may be seen perched beside their parents, or trailing after them when not going independently from point to point. They also form the habit of returning to their old home, either alone or with their parents, for more or less protracted visits; but it may be doubted if they ever receive food at the nest after having once gained their liberty. On July 5, 1922, the second day after the last bird was on the wing, both were back on the eyrie for a brief stay; and on the same day at Danbury, Ohio, where we visited another Eagle family and were told the young Eagles had been flying for a week, one of them was seen sitting on its nest while an old Eagle occupied a perch just above it. That they are eventually driven forth from the home-neighborhood by their parents and compelled to shift for themselves, as has often been asserted, is highly probable, although I have no direct observations bearing on this point.

IX. RECORD OF THE LAST TWO DAYS OF LIFE AT THE EYRIE.

The following record of events, which brought the aquiline drama to a close at Vermilion in 1923, is transcribed from our

notes for June 29 and 30. The life and behavior of young Eagles at the nest follows a rather definite routine, as in all other birds, though as will be seen, the lines in the picture may be variously shaded, and even new ones added, from day to day and from hour to hour.

June 29, 5:40 A. M. The remaining bird (Eaglet No. 2) flies to a branch on the east side of the nest, but finding it difficult returns and begins to flap and again rises into the air; in five minutes he tries the nest-perch, but is still restless and is back in a moment.

5:50 A. M. He takes the nest-perch again, but still finds balancing difficult and now helps himself, parrot-like, with his bill; he then straightens up, flaps a few times and starts to preen which proved to be the beginning of a long and elaborate operation.

6:40 A. M. Becoming bold while still on the nest-perch the Eaglet rises into the air, which he holds for a minute and then drops back to the eyrie, landing on its very edge, but saves himself from falling by vigorous flapping.

6:44 A. M. He now tries for a branch on the west side of the eyrie, three or four feet up, but misses his footing and falls back landing on his head.

7:30 A. M. After repeatedly hearing the scream of the first Eaglet, which for two days has been circulating about in our neighborhood, we see him perched very comfortably on a division of the north fork.

7:48 A. M. Eaglet No. 2 takes the nest-stub very easily this time and is quite as much at home there as on the nest (Pl. XXXII.); he preens again, anoints his feathers with numerous applications of oil and spreading out the tail and turning it to one side goes over each feather in succession.

8:17 A. M. The young Eagle screams as one of its parents reconnoiters the nest by flying directly over it, but its excitement dies quickly and the preening function is resumed with ardor.

8:45 A. M. He drops back to the nest which is explored for food, and upon finding a carcass to his taste goes to work at it.

9:05 A. M. Eagle No. 1, who has won its freedom, goes over the nest rather high up and the feeding bird pauses long enough to follow him with curious if not eager eyes.

9:30 A. M. No 2 is on the stub again, where attentions to his toilet are renewed.

9:45 A. M. Eaglet No. 1 is screaming to the east of our observatory and we see him as he flies very easily over the south side of the grove and takes a perch in a dead tree, his wings going up at the moment of alighting to maintain his balance in regulation fashion. Three minutes later he was on the wing again, and flying between the nest and the observatory took a perch low down in an oak tree five hundred feet away.

11:14 A. M. After spending one hour and forty-four minutes on the nest-perch the Eaglet came back to the eyrie, but almost immediately returned, helping himself with bill when his balance was lost; he was evidently restless and would gaze off into the distance and down upon the ground as if the inborn impulse to fly might master his fears at any moment. What holds him to the nest is, I believe, the satisfaction derived from his ability to circulate freely between it and that stub of a perch, though but a few feet away.

11:25 A. M. To my great surprise and delight Eaglet No. 1 comes screaming to his old nest, from which he had now been absent almost exactly two days and, strange as it might seem, the second bird which had dropped back from its perch, behaved towards him precisely as if he were the parent bringing food; he crouched, squealed, went to his former nest-fellow and putting up his bill begged to be fed; but the first bird was a seeker after food, not a purveyor of it; he was soon spread over the remains of a fish and with quick jerks of his head was extracting any morsels of nourishment that remained. Having received no satisfaction from the visitor, No. 2 retired to his stub-perch.

11:53 A. M. No. 2 drops to the nest, and behold! The tables are turned, for he has now become the "parent," and the first bird spreads before him, squeals, and trailing after him repeatedly holds up his bill for food; but, receiving no more satisfaction than he had been able to give when conditions were reversed, he stood on the edge of the nest, and in high-pitched, squealing cries for full twenty minutes proclaimed his hunger to all the world; finally when the world had paid no heed to his signals of distress, he settled down on the eyrie and sprawling out quite flat went to

sleep on his old bed. Meantime No. 2, who had retired for the sixth time to his favorite nest-perch, was engaged in an elaborate preening operation which lasted until long after noon.

1:15 P. M. Shortly after noon, Eaglet No. 2 having come back from the perch, both birds were playing with sticks, seizing them in the bill and dragging them about, but are now lying quite still, side by side as they have done many times before.

At this hour the sun shines full upon the whole front of the massive nest, throwing every bleached protruding stick into sharp outline; all colors seem to be intensified by the very clarity of the air and even the dull brown coats of the Eaglets seem to reveal a reddish tinge about their heads which was not noticed before.

2:10 P. M. Both birds try for the stub-perch, but the second bird, who has had more practise in the feat, gains the coveted spot and the other goes back to the nest for another siesta; for two hours the second Eaglet circulates between the perch and the eyrie and when not preening plays with sticks, jumping and prancing.

4:25 P. M. The female Eagle, which had taken her station on the tall east perch some minutes before, suddenly leaves, reconnoiters the nest and returns to the same point; leaving it again after a brief rest she is off to the eastward and makes direct for the lake.

4:36 P. M. Six minutes later she drops a fish on the eyrie, and as Eaglet No. 2 leaves the stub she at once takes his place; the first Eaglet, with his advantage of position, promptly grabs the fish and spreads over it, but the other bird is also hungry and a strange mix-up follows, until he finally yields the struggle to his more experienced companion.

After a brief rest on the stub the old Eagle returned to her tree-perch, which she had left but ten minutes before, and was immediately assailed by a doughty Kingbird but she was plainly too much bored to pay him more than casual attention.

5:09 P. M. The male Eagle sails in at high speed from the northeast, drops a fish on the nest and looking very keen and wary hops at once to the stub; in two minutes he was resting on the tall perch below his mate. Although No. 2 was on the stub when this fish appeared he manages to reach it first and with free

use of his bill is able to keep the other bird away, but not without a tussle.

June 30, 5:55 A. M. Just as we reached the upper platform the female Eagle delivered a large sheep's head, but upon seeing us, made off directly and took a new perch, which we had not seen occupied before, just north of the horizontal fork.

6:30 A. M. When we left the observatory last night one of the Eaglets was perched on a projecting stick on the right side of the nest, and one is there now; both have had a turn at the fish last brought; the female still holds the perch taken half an hour ago and the male is on the north fork.

The lake at this hour is hardly distinguishable through the haze which with the clear sky overhead promises a perfect day. A Tufted Titmouse is calling and Red-headed Woodpeckers are busy as usual all about our tent drumming and squawking.

7:25 A. M. The male, who had shifted to the tall east perch, has left, and in five minutes we see him coming direct from the shore flying very low; when about twenty feet away he rises, poises for an instant and drops with a thud on the eyrie; he carried his fish which was probably a mullet or small pike in the right talon, tarried hardly more than a minute and made at once for the tall tree-perch which he had so recently left. Eaglet No. 1 secures the fish without difficulty and after a repast of ten minutes retires to his perch on the projecting stick, while No. 2, who was evidently not ravenous, was content to play with sticks and when he approached the remains of the fish only pecked at it rather casually while holding it in one foot. A little later, when both old birds were on their perches, the young were also at rest lying flat on their nest.

8:15 A. M. The female has left her station on the north fork; twenty-eight minutes later, as I was adjusting the camera, a squealing chorus called my attention to the nest, on which she had just landed with a plucked chicken. She planted her feet on the prey and began to rip it up at once. The scenes which followed were typically aquiline. She would pull off a large mouthful with a jerk, and as each was swallowed bring up her head for a moment for a cautious glance about; both Eaglets were crouched, with wings and tail half-spread, and the feathers over the rest of

the body partly erect while uttering incessantly their peculiar squealing cries; as one ventured to approach she would feed him, passing the food from bill to bill although this proved to be the last day of life at the nest. At this, the third visit before nine o'clock, five minutes only were spent on the nest and nest-perch when she left for the taller and more favored post beside her mate in the grove, but well down in the shade.

10 A. M. Eaglet No. 2, who has been working for the past ten minutes on the fowl last brought, can be seen drawing out the intestines, some of which lie untouched by his side, and stripping the flesh off one of the legs, which as we can see wears a yellow boot.

10:14 A. M. Both of the Eaglets of a sudden begin to squeal, and cocking their heads to one side gaze up into the sky; upon drawing the canvass at the peek-hole nearer to my face I can see two Buzzards circling aloft like black aeroplanes some hundred feet or more above the nest; but, as it appeared, they were being watched by other and more jealous eyes; in an instant one of the old Eagles is in the air and makes post-haste for its eyrie which it encircles and then reconnoiters the entire neighborhood; at the same moment the Buzzards, which seemed to have suddenly lost whatever interest they may have had in the nest and its contents, begin to rise, and soaring ever higher and higher until at a safe distance of a mile or more from the earth, we could see the black pair, now joined by others, veer and move off to the west.

12:35 P. M. The Eaglet, which we have called "Number 2," has now passed two hours continuously on the nest-perch (See Pl. XXXII.), and during this time he has been mainly concerned with repeated attentions to his toilet. Would his behavior have been essentially different had he occupied a more distant and loftier tree-perch? I think not and am inclined to attribute his willingness to remain at the eyrie and the continued visits of the old Eagles with food to the presence of this convenient perch and the free use of it made by every member of the family. Accordingly I believe that the thread which has now held the first bird, in the rôle of visitor, for twenty-five hours to its old home, can be no other than this same stub; but how much longer the thread will hold can only be known when it snaps.

Ten minutes later both old Eagles leave their perches in the

tall tree as my assistant, Mr. Humel, passes them on his way to lunch.

1:10 P. M. The young flap and rise from the nest, No. 1 making a height of only three feet, and after "shooting" and flapping again retires to his corner. The second Eaglet now takes the perch and "rests himself" on one leg, while the other goes to feeding, to be joined in a moment by his fellow and together they search for any scraps of food they can find in the larder.

1:28 P. M. Both birds are again hunting about the nest for food, but No. 2 soon hops back to the perch and begins to preen; shortly after, when Mr. Humel returned with my lunch, neither of the old Eagles were on any of their habitual perches.

2:50 P. M. The first Eaglet without any warning takes to the air, and for the second and last time leaves his old home, after an hour of unusual quiet and after a visit of over 27 hours; and so we return to the conditions of three days ago with only one Eaglet (No. 2) in the nest.

After examining all the trees in our neighborhood we were convinced that in its second flight from the nest Eaglet No. 1 moved eastward nearly a quarter of a mile to an elm where ten minutes later, one of the old birds, probably the male, was seen perched. The lone Eaglet spent most of the afternoon on his stub, squealing emphatically at rather frequent intervals.

6:09 P. M. The male is seen to leave the tall east perch, which he has occupied for the last quarter of an hour, and flies over the Ranney place to the lake. With his glasses we can follow him far out over the water and see him drop down, turn and almost skim along towards the shore. In six minutes he returns with a big sheephead, over a foot long and perhaps weighing three pounds, in his talons; having dropped it in a hurry, he stayed but a minute for inspection and then was off for the perch which he had left but seven minutes before; that fish, we may be sure, was picked off the beach. Now the reactions of the lone Eaglet were rather curious; at the moment of the parental visit he was on the nest-perch and, as often happens in the presence of food, he seemed to "freeze" in his position; though unable to reach the fish, he must nevertheless go through the regular reaction-formula, squealing, erecting his feathers and half spreading his wings, which being

now deprived of any support, hang down at his sides. Although that fish was lying in plain sight on the eyrie but a few feet below him, its white belly glistening in the strong sunlight, and must have "beckoned" to him, he seemed disinclined if not quite powerless to move; for fifteen minutes, squealing much of the time, with his head turned around towards the nest and buried in the feathers of the back, he cut a strange figure on his perch. When he finally dropped to the nest he walked very deliberately up to the fish, planted one foot on it and began to peck rather casually at its head. Satiety may thus have been the impelling element in his peculiar behavior.

6:41 P. M. The male, after resting 25 minutes, was off for the lake once more, and in 16 minutes returns, and flying low over the cornfield adjoining the grove, rises to drop a small fish in the center of the eyrie. Something seems to have gone wrong or to have aroused his suspicions more than usually, for after coming to attention, he stood as if perplexed between two stools,—whether to go for the fish or to beat an immediate retreat; moving very cautiously and turning his restless wary eyes from side to side at every step, he walks slowly to the edge of the eyrie and with his right foot advanced and grasping a stick, before finally leaving, stands there for twelve minutes, ready to jump off at the least suspicious sight or sound.

7:30 P. M. When we closed the tent the lone Eaglet was still on his perch.

On the following day, July 1, as we were coming down the lane at 5:20 A. M., and were anticipating still further and perhaps more interesting events, the binoculars revealed our solitary bird very clearly as he stood upright at the side of the nest. As we entered the grove one of the old Eagles quietly left its favorite perch, but upon nearing the nest-tree we found that our last Eaglet had taken its maiden flight and given us the slip. Shortly after, a young Eagle, perhaps this one, was detected in the same elm tree, a quarter of a mile away, in which the first had been seen after his final flight from the eyrie on the afternoon of the day before.

The last day, June 30, had proved the most interesting of all; for thirteen hours we had watched the old and young Eagles



1. EAGLET NO. 1 IN AIR, MAKING ITS FIRST FLIGHT FROM NEST.
2. EAGLET NO. 2 ON NEST PERCH, THE LAST DAY OF ITS LIFE AT NEST, STANDING ON ONE LEG AND BALANCING WITH STRETCHED WING ON SAME SIDE.



continuously and had been able to observe the curious interplay of their mutual reactions, to witness five visits of the old birds to their eyrie, and to make a long series of photographs selected as a record of successive events. There was no ringing down of the curtain. It had fallen silently and the play was over.

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MIMICRY OF VOICE IN BIRDS.¹

BY CHARLES W. TOWNSEND.

THERE are some birds that are noted for their imitations of other birds' voices—of their various call and alarm notes and of their songs. This mimicry may be conceived to be conscious or intelligent, on the one hand, or unconscious, that is mechanical, on the other, or not mimicry at all, but merely an accidental resemblance.

For example, that particular scream of the Blue Jay which resembles so closely the scream of the Red-shouldered Hawk that one can not be sure of the identity of these two birds by the voice alone, may be either an accidental resemblance or a conscious or unconscious imitation. If it occurs among Blue Jays which have never heard a Red-shouldered Hawk scream or whose associates or ancestors have never heard this scream, then we must say that the resemblance is merely accidental. Some Blue Jays breed in northern regions where Red-shouldered Hawks are unknown, but they all in migration may hear the scream of this Hawk or the mimicked cry of other Blue Jays. Hence, although it still may be an accidental imitation, it may, on the other hand, be a conscious or an unconscious one. Those who believe that beasts and birds are merely "machines in fur and feathers" would say that, if the mimicry were not accidental, it must be unconscious or mechanical. When, however, one observes a human infant endeavoring to imitate sounds, or observes a bird, after listening to

¹ Read at the Meeting of the American Ornithologists' Union in Cambridge, October 9, 1923.

another bird, repeating its notes—in both cases with increasing proficiency and apparent satisfaction with the repetitions—one can not help being struck with the similarity of these two cases, and with the appearance, to say the least, of conscious imitation in both child and bird.

Lloyd Morgan¹ makes three stages of mimicry in the development of the child: "First, the instinctive stage, where the sound which falls upon the ear is a stimulus to the motor-mechanism of sound production. Secondly, the intelligent stage of profiting by chance experience . . . If we assume that the resemblance of the sound he utters to the sounds he hears is itself a source of pleasurable satisfaction (and this certainly seems to be the case), intelligence, without the aid of any higher faculty, will secure accommodation and render imitation more and more perfect. And this appears to be the stage reached by the Mockingbird or Parrot. But the child soon goes further. He reflects upon the results he has reached."

There is still another possibility, the inheritance of mimicked voices. Eliot Howard in his work on British Warblers says of the mimicry of the Blackcap, "There are some grounds for believing that part of the imitations may be congenital, the acquired imitations of the parent being transmitted to the offspring."

Donald R. Dickey² reports an immature male Western Mockingbird that was "successfully 'imitating' the notes of the Sparrow Hawk, Killdeer, and Cactus Wren . . . The very few months which had actually elapsed since this youngster first saw light would seem to form all too short a period for the purely imitative acquisition of so varied a repertoire," and he asks "May not generations of usage have made this ability an inherent rather than a mimetic characteristic?" But he goes even farther than this and suggests that the apparent imitations may be as much an inherent part of the song as were the true Mockingbird phrases. "In other words," he asks, "may this not be a case of parallel ability and adventitious similarity rather than actual and individual mimicry?"

If the cases of apparent mimicry were limited in number and

¹ 'Animal Behaviour,' 1908, p. 193.

² "The Mimetic Aspect of the Mocker's Song." 'Condor,' 1922, XXIV, p. 153.

imperfect in form, this accidental or adventitious similarity might be considered, but the very large number of perfect reproductions by Mockingbirds and by other birds renders this latter suggestion highly improbable. Mr. Dickey suggests that if the young Mockingbird "had been transplanted as a nestling to a favorable habitat on which the note of Sparrow Hawk, or Killdeer, or Cactus Wren, had never fallen, he would yet have greeted approaching maturity with 'imitations' of their songs." This is an experiment that should be tried.

An experiment exactly similar to this has been tried in this country on a large scale and it is capable of throwing much light on these subjects. The European Starling, one of the best of mimics, was first successfully introduced from Europe into this country in 1890. The period of time that has elapsed since then is certainly not enough to have permitted it to acquire by inheritance a mimicked song, neither is it long enough to have effaced the inheritance of previously inherited songs. That is to say, if the mimicry of other birds' songs has become part and parcel of the Starling's repertoire by inheritance through many generations, we should expect to find the Starling in this country repeating the songs of Old World species, and not the songs of American birds. On the other hand, if the reproduction of bird songs comes about by individual mimicry, we should find that in Europe the Starling would mimic European birds and, in America, American birds, and this is indeed the case. The evidence on a large scale provided by the Starling is of great value and, in the case of this bird at least, confutes Mr. Dickey's hypothesis.

In the following studies of mimicry, the facts seem to me to point clearly to conscious or intelligent mimicry. The assertion is sometimes made by those who have not paid serious attention to the subject that the resemblances are sometimes fanciful and more in the mind of the recorder than the facts warrant. I have endeavored to avoid this criticism by relating only striking resemblances and I believe the fanciful element is absent.

The European Starling's powers of mimicry have long been known and have been taken advantage of and developed in captivity. Dresser, in 'The Birds of Europe,' says: "As a cage bird the Starling is easily domesticated and soon learns to articulate

words and whistle tunes. Baron R. König Warthausen gives some interesting details respecting a singing and talking Starling who lived in 1582, and who sang and spoke in German and Polish and had given itself a name in the latter language."

European ornithological literature contains many references to this habit. Charles A. Witchell¹ says that "this bird is one of the best mimics, and its reproductions of the notes of other birds, and even of animals, are as exact as they are various." H. L. Saxby² says: "The Starling imitates the note or cry of almost every bird, not even excepting the Herring Gull, but its chief models seem to be the Oyster-catcher, the Redshank, the Golden Plover, the Whimbrell, and the Curlew; these it mimics so perfectly as often to deceive the most experienced ear."

Owing to the frequency with which the Starling in New England imitates the Wood Pewee, it has been suggested by more than one person that these notes may be some of its native ones, and that the mimicry, which is very perfect, is merely accidental. I, therefore, consulted Mr. Henry Mousley, who is familiar with this bird both in this country and in England. He wrote me that he had heard this imitation here but never in England, where he has heard it "imitate the following quite perfectly, viz.: Sparrow, Yellow Hammer or Yellow Bunting, Chaffinch, Robin, Curlew, Pheasant, Green Woodpecker, Jackdaw, Peewit, Golden Plover, Blackbird and Dunlin. Besides these he has been known to imitate perfectly a dog whistle, and the tinkle of a particular cycle bell, the latter so perfectly as to delude its hearers!"

I am inclined to think that individual Starlings vary greatly in their powers of mimicry. Some rarely or never mimic, while others are constantly indulging in this practice. One that I observed on an early day in April in Ipswich, imitated perfectly the call notes of the Robin, some of those of the Herring Gull, the bell-notes and scream of the Blue Jay, the call of the Cowbird, the songs of the Meadowlark and of the Wood Pewee, and the masterful call of the Greater Yellow-legs. When this last distinctive and familiar call came rolling forth, I instinctively turned and swept the marsh with my eyes, expecting to see the flashing white rump of this

¹ 'The Evolution of Bird-Song.'

² 'Birds of Shetland.'

bird, but on turning back to the Starling, I saw his raised head and moving bill which revealed the mimic. As far as I knew, the Yellow-legs had not arrived from the south; the Starling, perhaps, had left him behind in the migration.

Mr. Ralph Lawson has heard the following additional birds mimicked by the Starling: Whip-poor-will, Bob-white, Goldfinch and Black-billed Cuckoo, and Mr. Charles L. Whittle has added the Chickadee, Redwinged Blackbird, Phoebe and Crow to the list.

The Mockingbird is the best known and the most proficient mimic among our native birds. Although a bird of the south, it frequently wanders into New England. The famous "Arnold Arboretum Mockingbird," whose songs were studied for several years and described in detail by the late Mr. H. W. Wright, has been heard to imitate fifty-five different birds. On one of my visits to him, he was at his best, and, in the course of an hour, imitated twenty-one birds. His imitations of the varied notes of the Blue Jay were particularly striking, and included the harsh Jay scream and the lovely bell-notes. Whether the scream of the Red-shouldered Hawk was copied from the original or from the Blue Jay, I do not know. The alarm and call notes of the Robin were as perfect as was the cheerful, glorious song of this familiar bird. The multiple calls of the Flicker were evidently favorites of his and were introduced at frequent intervals between the longer songs. I looked for a Phoebe in the bushes until the Mockingbird sailed close over my head, uttering a perfect imitation of the Phoebe's song. The melody of the Song Sparrow was unmistakable but not perfect. It was evident the mimic needed more practice. The rattling of the Crow and of the Kingfisher, the whistle of the Bob-white, the calls of the Barn Swallow and the songs of the Baltimore Oriole, the Bluebird, the Scarlet Tanager and the Chewink, all in turn delighted my ears.

There were frequent interpolations of the harsh notes of other birds as well as those, doubtless, of his own devising, between the musical parts of the performance. The whole was in the nature of an intellectual treat, for one was constantly on the alert to detect new imitations, and there were no doubt many that I was not clever enough to recognize. This bird was an unusual one

among Mockingbirds, an expert mimic with a large repertoire, which he appeared to be perfecting by practice and to which he was constantly adding. Could anyone doubt, in listening to him, that his imitations were conscious ones and that he took pleasure in them?

Dr. S. C. Brooks has related to me an interesting instance of what appears to be conscious mimicry in this Mockingbird. The bird was imitating the calls of the Killdeer, when a Sparrow Hawk flew by, and the mimic at once set up the rolling call of this Hawk.

The Brown Thrasher, a near relative of the Mockingbird, has a more continuous song and, at its best, one of great beauty and power not marred by harsh or disagreeable notes. His song consists of a series of couplets with here and there an enthusiastic triplet or even a quadruplet. It is an inventive song. He is constantly improvising, but there is often the suggestion of mimicry as the song wanders on and new phrases appear and are repeated. It is rare, however, that one can recognize the source of the mimicry. I have detected the call of the Bob-white and the melody of the Robin, the Bobolink and the Veery, but mimicry is not needed to complete the perfection of his song. He generally avoids vulgar plagiarism, but doubtless profits by the musical suggestions of other birds.

Another bird of this group and a true mimic is the Catbird. Like the Mockingbird he interlards his song with harsh and unmusical notes, often with his well known cat-like *mews*, which are sometimes short and emphatic, sometimes long drawn out and plaintive. He appears to be constantly trying some new combination of notes, and some of his improvisations are very sweet and musical. These he occasionally repeats in the manner of the Brown Thrasher, particularly when a musical phrase appears to tickle his fancy. Thus, I once heard a Catbird rolling off a delightful phrase which sounded like *Peter-boro, Peter-boro*. This he repeated five or six times, then *mewed* and tried something else. If the Catbird would suppress his love of bizarre and harsh notes, and of buffoonery and horse-play—for I suspect he has a sense of humor—and would devote himself more continually to his musical repertoire, he would rank among our best singers. He is, however, badly handicapped by his name.

In my notes I have recorded a number of birds that are mimicked by the Catbird. I have heard him imitate the Blue Jay's common scream, the whistle of the Bob-white, the calls of the Flicker, the alarm notes and song of the Robin, the call notes of the Barn Swallow and of the Goldfinch, the songs of the Rose-breasted Grosbeak, Veery, Wood Thrush and Red-eyed Vireo—although in the richness and variety of the notes the last imitation matched more closely the song of the Solitary Vireo—the couplets of the Brown Thrasher, the alarm call of the Greater Yellow-legs and the rattle of the Kingfisher. I was completely deceived at first by the Yellow-legs imitation and looked out on the marsh for the long-legged originator but soon saw the mimicking Catbird, who after a little, began to *mew* in his own proper manner. On both occasions that I heard the Kingfisher's rattle mimicked by this bird, I was close to a river, on it in one case in a canoe, and the Catbird swooped down in crossing the river so that the actions as well as the voice of the Kingfisher were imitated.

Dr. Glover M. Allen has kindly sent me for inclusion here a note on this versatile bird which illustrates and explains its methods in mimicry. He writes: "Some years ago at Newton, Mass., I made daily visits to an old marsh on the edge of an apple orchard to look for birds. A Catbird was heard singing in a certain spot on these visits and close by a Least Flycatcher had a nest and one of the birds was constantly giving its *chebec*. The Catbird was one day noticed giving a note that was so different from its usual utterances that I stopped to listen. Several times a subdued chebec-like sound was given similar to the Least Flycatcher's but in a different tone or at least it was a poor imitation. Several times on subsequent days I heard the Catbird practicing this note as it were. Once the Least Flycatcher was singing at the same time and the Catbird would give its imitation, then stop as if (this was the appearance) to listen again. It finally became so good that its imitation was close enough to have passed easily for the Chebec's own note. In other words with the pattern before it so to speak, it had perfected its imitation until it was an almost exact reproduction of the Least Flycatcher's note. It seemed a clear case of mimicking."

An interesting instance of mimicry in the Catbird is reported

by Marie Ellis Hegler ('Bird Lore,' XXV, 1923, p. 252) who, every time she saw a particular Catbird in her garden, greeted it with a short whistling call hoping that it would imitate her. This imitation did not occur that summer, but the next spring she was startled by hearing her own familiar whistling call and discovered the Catbird to be the source.

Mr. Francis H. Allen, a keen observer, especially in the matter of bird notes, has also heard the Catbird mimic the Chebec as well as the following birds: Crested Flycatcher, Wood Pewee, Cowbird—the flight call—Chewink, Scarlet Tanager—the *chip-chur* call—Yellow-throated and Red-eyed Vireos, Black-poll Warbler, Brown Thrasher, Wood Thrush and Robin.

Another mimic, which like the Mockingbird belongs in the Austro-riparian zone, but sometimes is found in the Transition zone, is the Yellow-breasted Chat. For six years, from 1908 to 1913, I had the opportunity to study one or possibly two pairs of these birds at Ipswich. They inhabited a tangle where Brown Thrashers, Catbirds and Red-winged Blackbirds were common. The varied calls of these birds were mimicked more frequently than those of any other birds, and the mimicry was so perfect that I could never be sure that a Chat was responsible unless I saw him lift his head and open his bill when the sounds were produced. He smacked like a Thrasher, mewed like a Catbird and chucked like a Red-wing. The clear melodious notes of the Robin and Baltimore Oriole were reproduced as unmistakably as were their alarm notes. The *jay jay* of the Blue Jay and the squirrel-like rattle of the Maryland Yellow-throat, as well as the varied *caws* of the Crow were all given in perfection. The clucking of a domestic hen and the barking of a small dog made me look about for the originals, until I found that the Chat was the producer of these sounds. Doubtless many more imitations by the Chat are to be heard in its southern home, but these will suffice to show the bird's powers of mimicry.

As far as I know, the only mimicry in which the Blue Jay habitually indulges, is the cry of the Red-shouldered Hawk. The imitation is so perfect that, on hearing this cry, if one does not see the bird, one should wait and in a short time the *jay jay* cry will reveal the mimic, if such it be. On one occasion I heard the Red-should-

ered Hawk's cry frequently and loudly repeated, and saw two of these birds circling about, but in a different direction from the source of the sound. Presently the cry changed to *jay jay*, and I discovered some Blue Jays near at hand. The circumstances suggested that they had espied the Hawks and were mimicking them. Mr. Francis H. Allen tells me he has heard the Blue Jay mimic the *kip kip* call of this Hawk as well as the call of the Broad-winged Hawk. Aside from repetitions of sweet notes that strongly suggest the song of the Brown Thrasher, and notes that suggest those of a Carolina Wren, I have heard no other imitations by this bird.

Audubon expresses the opinion that the discordant cries of the Shrike are imitations of birds in distress, and that they serve to beguile small birds within his reach. This fanciful and improbable theory comes down from the Middle Ages, for one Dame Juliana Berners denounced for the same reason the European Grey Shrike and stigmatized it as "an ungrateful subtell fowle." The disconnected song of the Northern Shrike, with its mixture of harsh and sweet notes, suggests that of the Catbird. Sometimes the clear notes resemble those of Robins, sometimes those of Blue Jays and again of Red-eyed Vireos. With the latter birds Shrikes were formerly classed.

The Solitary Vireo is a bird that appears to take pleasure in improvising and in repeating certain phrases. I once heard one in Gaspesia that repeated the phrase *tu-a whee* five or six times very sweetly and then paused while another Solitary Vireo mimicked it perfectly. Then number one tried another phrase, and this also was imitated, but, after a couple of more lessons, number two evidently tired of the game and remained silent. It is probable that in this way an inventive bird may add to and improve the songs of those of his neighbors who are bright enough to imitate him.

A parallel instance is furnished me by Mr. F. A. Saunders, who tells me that, by changing the pitch of his whistling imitation of a Chickadee's song, he has induced the Chickadee to change his pitch also.

Another bird of the Upper Austral zone, the White-eyed Vireo, which extends its breeding range north of Boston, should be classed,

it seems to me even on slight acquaintance, as a mimic, and a very Chat-like one. I have heard him call like a Bob-white and a Whip-poor-will. Burroughs speaks of his notes suggesting those of the Robin, Wren, Catbird, Flicker, Goldfinch and Song Sparrow, and W. L. McAtee says he has heard this Vireo imitate closely the notes of the Wood Pewee.

The similarity in some of the notes of the Golden-crowned Kinglet, Brown Creeper and Chickadee, birds that associate closely in similar environment, is significant.

Some years ago in Ipswich, on three occasions in the month of June, I heard and saw a Song Sparrow sing the clear, sweet whistling trill of the Field Sparrow with a Song Sparrow ending. Occasionally he would sing an ordinary Song Sparrow song. The bird was always in one particular tree.

The family of Warblers is noted for the variability of its songs. Many, besides having two distinct songs, sing at times in a way that suggests other members of the group. The close association of different species of Warblers in the same habitat gives opportunity for imitations. I have heard a Chestnut-sided Warbler trill like the Pine Warbler, and another, whose notes were loud and clear and frequently repeated, recalled in a surprising way the song of the Oven-bird. The song of the Nashville Warbler is characteristic and easily recognized, but I have been astonished on two occasions to detect a Myrtle Warbler singing this song.

At Isle Haute, Nova Scotia, where, in a bit of woods, Tennessee Warblers were in full song, a Black-throated Green Warbler sang so exactly like his Tennessee neighbors that I would have been deceived had I not seen the singer at close range and detected him in the act. Later I heard and saw the same bird sing his own distinctive song.

Mr. F. H. Allen has several times heard the Prairie Warbler begin its song with an excellent reproduction of the song of the Field Sparrow that was singing nearby. He has heard a Red-eyed Vireo introduce the call of the Bluebird in his song, the Scarlet Tanager imitate the notes of the Olive-sided Flycatcher so perfectly as to deceive him at first, and the Purple Finch add notes from the song of the Barn Swallow.

Witchell¹ suggests that, as nestlings reared by hand have so often been observed to imitate the song and notes of other species in the same cage or even the various sounds heard around the cage, wild nestlings in the same way have had their future songs influenced by the sounds familiar to them in their environment. "It may be justly surmised," he says, "that nearly the whole range of bird-song may have been affected by the imitative faculty, which we know to have been so wide-spread an influence in the animal world; and that the voice of the bird has been attuned to harmony with neighboring sounds, just as its colours so often blend with those of its surroundings."

The song of the Water-Thrush has a bubbling, watery character as has also that of the Canadian Warbler and Winter Wren,—all birds that often build their nests within hearing of rippling brooks. The song of the Sharp-tailed Sparrow resembles the hissing of the tide through the grass besides which its nest is built. The Grasshopper Sparrow, as its name implies, and the Savannah Sparrow have songs which resemble the grasshoppers that abound in the fields where the young are raised. Wilson says that the song of the Long-billed Marsh Wren is "something similar to that produced by air-bubbles forcing their way through mud or boggy ground."

In the evolution of bird-song, mimicry as well as invention have through sexual selection played a part. It is obvious that natural selection would have a limiting effect on mimicry. Thus, the Song Sparrow that always sang like a Field Sparrow, would run little chance of getting a mate. The conservatism and clannishness of birds would preclude wide variations in song.

By the term invention or improvisation, I do not mean that a bird produces an entirely new and complete song, but that he adds short phrases or slight variations under the impulse of rivalry, or from the mere aesthetic pleasure of the performance. If these new phrases are copied from the songs of other birds, it is a case of mimicry, but if not, the case should be classed under improvisation. It is sometimes difficult to separate these, as in the case of human music, but familiarity and close attention has long convinced me

¹ *Op. cit.*, p. 229.

that both of these methods are present in the evolution of bird-song.

In the case of some birds like the Mockingbird, the Starling and the Chat, mimicry has become an integral part of the vocal courtship. Birds like the Catbird and Shrike are obviously making use of mimicry in the improvisation of their songs. Mimicry is less evident, but is occasionally to be detected, in the songs of the Brown Thrasher and Solitary Vireo, as well as in the notes or songs of many other birds, especially in the group of Warblers

Our greatest avian musician, the Hermit Thrush, is an improviser or inventor of the first rank, and, although some of his notes may have had their inspiration in the songs of other birds, he appears to be entirely original. The Hermit's near relative, the Olive-backed Thrush, on the other hand, shows but little variation in his song. He appears to be neither an improviser nor a mimic.

Witchell¹ mentions over a score of British birds where he has observed mimicry, and, from my own studies, I am convinced that mimicry among our American birds is more common than is generally supposed. It follows, therefore, as a minor corollary that, while sight records are worthless unless the observer is known to be accurate, records by hearing alone, even if the recorder is an expert, may be worthless, owing to this prevalence of mimicry. Above all, one should beware of the mimicry of that specialist, the European Starling.

98 Pinckney St., Boston, Mass.

NOTES ON THE BIRDS OF WALLOWA COUNTY, OREGON.

BY IRA N. GABRIELSON.

DURING the past four years field supervision in the rodent control work of the Biological Survey has taken me at various times into Wallowa County, which is the northeastern county of Oregon. This county has now been visited at practically every season of the year and notes have been taken on the birds seen

¹ *Op. cit.*, pp. 159-229.

while there. The results of these observations, together with a few other records contributed by Mr. Stanley G. Jewett, form the basis of the present paper.

Wallowa County is one of the most interesting counties in a very interesting State. It is typically a mountain county, the Wallowa Mountains being a spur of the Rocky Mountains and containing Rocky Mountain forms rather than those of the Cascades. This Rocky Mountain fauna penetrates several counties of northeastern Oregon, and it is more typically found in this than in any other.

The arable land of Wallowa County lies largely in the valley of the Wallowa River, which flows from its source in the Wallowa Mountains in the south-central portion of the county in a general northwesterly direction. The main chain of the Wallowa Mountains rises abruptly on the south of this valley. Entrance to it is by railroad through the canyon of the Grand Ronde to the point where the Wallowa enters it, and then following the Wallowa River up through the valley. To the north of this valley is considerable open country of rolling hills, which originally was mostly bunch-grass country. These hills reach a general altitude of approximately 5,000 feet. To the north lies a big rather flat timbered country known as the North Woods, the Wallowa Valley being thus completely encircled by timbered country.

On the east side of the county is the deep canyon of the Snake River, paralleled a few miles to the west by the canyon of the Imnaha. The Imnaha flows into the Snake River well toward the northern end of the county and its mighty canyon is unnoticed only because of its nearness to the far greater one cut by the Snake River through these mountains.

The lower belt of timber is composed largely of yellow pine, while farther up on the mountain, spruce, fir, and lodge-pole pine predominate. Between the canyons of the Imnaha and the Snake is a high, more or less open ridge with large open thickets of lodge-pole pine, and it is here that the Franklin's Grouse and the Mountain Sheep are making their last stand in the state of Oregon.

The elevation of this county varies from 2,700 feet at Wallowa to nearly 10,000 feet in the higher peaks of the main Wallowa Range. This range of mountains is rugged in the extreme and it is carved into many deep canyons by various streams. In the

higher parts of the range are found many lakes, which form the head-waters of the various creeks and rivers originating in the district. The Minam River for a long distance forms the western boundary of the county. It originates on the western slopes of Eagle Cap, while one of the forks of the Imnaha rises on the eastern base.

While my notes are incomplete on migratory birds, particularly Ducks, Shorebirds, and similar forms, they are probably reasonably complete as far as breeding birds are concerned.

The 1910 A. O. U. 'Check-List' and its Supplements have been followed as to nomenclature, except that some later subspecific names are used.

Mergus americanus. MERGANSER.—This bird is a fairly common resident. I have noted one or more from the train in traveling up the Wallowa River, on every trip that I have made into the county. It is more abundant along this river in the winter months when little flocks of from three to five or seven are seen at frequent intervals in the more open stretches of the river.

Anas platyrhynchos. MALLARD.—Ducks have not been noted frequently in this county. There are few or no ponds on the lower flats, but flocks of Mallards have been noted on March 7, 1920, and February 10, 1921, in flood water pools near Enterprise.

Nettion carolinense. GREEN-WINGED TEAL.—One pair noted near Enterprise, February 20, 1919.

Clangula (sp.?). GOLDEN-EYE.—Golden-eyes have been noted on several occasions on Wallowa Lake, but whether the American or Barrow's could not be determined.

Gallinago delicata. WILSON'S SNIFE.—Single individual noted in the town of Wallowa, February 10, 1921. Ground was deeply covered with snow and the creek fed by a warm spring had kept open a piece of meadow land where this bird was feeding.

Actitis macularia. SPOTTED SANDPIPER.—This Sandpiper was noted on numerous occasions along the Wallowa and Imnaha Rivers, and a pair was seen at Lick Creek Ranger Station, July 27, 1920.

Oxyechus vociferus. KILLDEER.—This is a very common bird in this county. I have noted it on every trip after the first of March until late in October. It is very common throughout the valley, and on June 20, 1919, I found it at Memaloose Ranger Station at an altitude of 6,600 feet.

Colinus virginianus virginianus. BOB-WHITE.—The Bob-white has been introduced and is quite common in the Imnaha Canyon, where I noticed it on June 23, 1919, and May 25, 1921.

Oreortyx picta plumifera. PLUMED QUAIL.—This bird was noted in the Imnaha Canyon on May 26, 1922. Comparison with specimens from the coast district of Oregon indicates that Quail of this district are of this subspecies, although they are possibly introduced.

Lophortyx californica (subspecies?). CALIFORNIA QUAIL.—According to S. G. Jewett, this bird was introduced into Wallowa County in 1912. It is now quite common in the Wallowa Valley, having been noted at various places between Enterprise and Wallowa. Introductions have served to badly mix up the Quail of this genus in Oregon.

Dendragapus obscurus richardsoni. RICHARDSON'S GROUSE.—This is a common Grouse throughout the entire mountain district of the county, although not exceedingly abundant anywhere. I have noted it on every visit to the timbered sections. A female with five young was seen near Memaloose Ranger Station, June 22, 1919.

Canachites franklini. FRANKLIN'S GROUSE.—S. G. Jewett reports that one was taken at Lick Creek Ranger Station in 1912. Forest Supervisor N. J. Billings, of the Wallowa Forest, has informed me that he has seen this Grouse at Memaloose Ranger Station, and the fire guards and rangers in the Lick Creek district have reported it as being present on numerous occasions. In the summer of 1920, shortly after my visit into the district, a fire guard caught two young ones in his hands.

Bonasa umbellus umbelloides. GRAY RUFFED GROUSE.—The Ruffed Grouse of this district are not typically *umbelloides*, but seem to be nearer that than any other subspecies. They are very common in the valley and are found in some numbers high up in the canyons. This is perhaps the most common Grouse of the district at this time.

Pedioecetes phasianellus columbianus. COLUMBIAN SHARP-TAILED GROUSE.—The Sharp-tailed Grouse was formerly an abundant bird, but now it has nearly reached the vanishing point. Mr. Jewett saw one on February 19, 1919, within the city limits of Enterprise, and I saw two on February 27, 1920, within a block of the high school building. These birds evidently stayed in that vicinity, as I saw them again the following day and once later.

Phasianus torquatus. RING-NECKED PHEASANT.—This bird, commonly known as the China Pheasant or "Chink," has been successfully introduced into Oregon over a wide territory. It is exceedingly abundant in the Blue Mountain district. Umatilla, Union, and Wallowa Counties probably have the largest Pheasant population of any of the counties in the State. It is a wonderful game bird, but there is considerable complaint from farmers regarding the damage it does to cultivated crops.

Zenaidura macroura marginella. WESTERN MOURNING DOVE.—This bird is as abundant here as it is elsewhere in eastern Oregon. It is found everywhere through the cultivated districts and in some numbers in the mountains. I noted it particularly at Memaloose Ranger Station, an altitude of 6,600 feet, on June 20, 1919.

Cathartes aura septentrionalis. TURKEY BUZZARD.—A Turkey

Buzzard was noted at Enterprise on June 25, 1919, and at College Creek Ranger Station in the Imnaha Canyon on May 26, 1921. It is not so abundant in Wallowa as it is in some other eastern Oregon counties, although it has been noted at other dates than those given above.

Circus hudsonius. MARSH HAWK.—A Marsh Hawk was noted at Wallowa Lake, April 12, 1919, and one individual at Enterprise, March 7, 1920.

Accipiter velox. SHARP-SHINNED HAWK.—One individual was noted near Enterprise, February 19, 1919; and two in Imnaha Canyon, May 26, 1921.

Accipiter cooperi. COOPER'S HAWK.—One was shot near Wallowa, May 24, 1921.

Buteo borealis calurus. WESTERN RED-TAIL.—The Western Red-tail is the most abundant large Hawk in the county. It has been noted at Wallowa Lake, April 12, 1919; Memaloose Ranger Station, June 20, 1919; Enterprise, March 3, 1920; Wallowa, March 10, 1920; Lick Creek Ranger Station, July 26, 1920; and at Wallowa, July 22, 1921.

Buteo swainsoni. SWAINSON'S HAWK.—One noted at close range at Wallowa, July 21, 1920. This bird was carrying a freshly killed *Citellus* in his claws as he flew slowly by and alighted on a telephone pole.

Archibuteo lagopus sancti-johannis. ROUGH-LEGGED HAWK.—Two Rough-legged Hawks were noted on February 10, 1921, one at Wallowa and the other near Enterprise. They are probably quite abundant in the county, but this was my only winter trip into the district.

Aquila chrysaetos. GOLDEN EAGLE.—The Golden Eagle is very common in the Wallowa country. It has been noted at Enterprise, February 24 and 25, 1919, and May 25, 1921, and in various other parts of the county. On February 25 one flew very close over the automobile in which I was riding.

Falco mexicanus. PRAIRIE FALCON.—One noted at Wallowa on May 24, 1921, and a pair about a high cliff between Enterprise and Imnaha post office on May 25, 1921. These birds acted as if they had a nest on the cliff, but the rocks were too high and too much broken for us to discover it from the ground.

Falco columbarius columbarius. PIGEON HAWK.—A small Hawk sitting in a large tree alongside the road allowed a very close approach. When killed it proved to be a male Pigeon Hawk of the above subspecies. This bird was taken near Enterprise, April 11, 1919.

Falco sparverius phalaena. SPARROW HAWK.—The Sparrow Hawk becomes abundant in this county during the summer as it does in all other parts of eastern Oregon. During July and August it can be seen everywhere on the telephone posts along the roads.

Otus asio macfarlanei. MACFARLANE'S SCREECH OWL.—Mr. Jewett reported one from the head of Sheep Creek, September 1, 1919. I have several times heard Screech Owls calling at Enterprise, Wallowa, and along Bear Creek, but have never seen one or succeeded in taking one. Specimens from this country which I have seen are *macfarlanei*.

Bubo virginianus (subspecies?). HORNE OWL.—A *Bubo* is very common in Wallowa County. I have never killed one and have not been able to see any specimens, so I am not certain as to the subspecific identity.

Glaucidium gnoma pinicola. ROCKY MOUNTAIN PIGMY OWL.—There is one specimen in the Jewett collection taken at Wallowa, February 28, 1919. I have several times heard them calling about the town of Wallowa, but have never seen one. Ridgway ('Birds of Middle and North America,' Vol. VI, pp. 779-792) recognized several races of Pigmy Owls not included in the 1910 Check-List. If he is followed it appears that three of these races are found in Oregon although he gives records of only two. Ten specimens in the Jewett collection from various parts of the state are at hand. The one from Wallowa is identical with two from Boise, Idaho, all three of which fit perfectly Ridgway's description *G. g. pinicola*. One from Klamath Falls and one from Grants Pass—both in southern Oregon—are referable to *G. g. californicum*. Two from Netarts on the Tillamook County coast are apparently typical *G. g. grinnelli*. One from Eugene appears to be closer to *californicum* than to *grinnelli*, while one from Roseburg is very similar to the Netarts *grinnelli*. It is probable that in this district (Umpqua Valley and southern Willamette Valley) the two forms intergrade, but more material than is available to me at this time would be necessary to determine this point.

Ceryle alcyon caurina. NORTHWESTERN BELTED KINGFISHER.—The Kingfisher is one of the common birds of the county and particularly of the Wallowa Valley section. It has been seen on every visit and is one of the most conspicuous forms along the rivers, creeks, and lakes of the county.

Dryobates villosus monticola. ROCKY MOUNTAIN HAIRY WOODPECKER.—This is the most abundant Woodpecker of the county. It is found everywhere from the bottom of the Wallowa Canyon to timberline. I have never made a visit without noting this bird.

Dryobates pubescens homorus. BATCHELDER'S WOODPECKER.—This bird is as rare in Wallowa County as the preceding form is abundant. I have only seen two individuals, one at Enterprise, February 19, 1919; and one at Wallowa, February 23, 1919. Both were in a clump of willows that lined the border of the Wallowa River at these points.

Xenopicus albolarvatus. WHITE-HEADED WOODPECKER.—This very curious Woodpecker is sparingly found in the mountainous sections of the county. One was noted at the entrance to Hurricane Creek Canyon, flying about a large dead pine, on March 7, 1920. Two were seen near Stanley Ranger Station, July 22, 1920.

Sphyrapicus varius nuchalis. RED-NAPED SAPSUCKER.—My only record of this species is at Wallowa Lake on April 12, 1919, when two individuals were noted.

Sphyrapicus thyroideus. WILLIAMSON'S SAPSUCKER.—This beautiful Sapsucker was noted at Stanley Ranger Station on July 22, 1920, and at Lick Creek Ranger Station on July 27 of the same year.

Phloeotomus pileatus abieticola. NORTHERN PILEATED WOOD-

PECKER.—The Pileated Woodpecker is fairly common for so large a bird. It has been noted at various times in the mountain districts, and one individual was seen in the edge of town at Enterprise on March 7, 1920. All of the other records are in the mountain district, but not high up. They were noted at Wallowa Lake, in the breaks near Bear Creek, and the Imnaha Canyon.

Asyndesmus lewisi. LEWIS'S WOODPECKER.—A common bird in the Wallowa Valley, also in the Imnaha Canyon. In its habits it reminds me a great deal of the Red-headed Woodpecker of the East, and it is commonly found along the fence posts and telephone poles and works from one to another in the same fashion as its eastern relative.

Colaptes cafer collaris. RED-SHAFTED FLICKER.—The Red-shafted Flicker shares with the Rocky Mountain Hairy Woodpecker the distinction of being the most abundant Woodpecker in the county. It is, however, far more conspicuous in the cultivated districts. This species is one of the three or four most common and conspicuous birds of the valley district and is to be seen everywhere. It is also common in the higher mountain district, but in these places hardly so abundant as the Hairy Woodpecker.

Chordeiles virginianus hesperis. PACIFIC NIGHTHAWK.—A common summer resident of Wallowa County. I have seen it well up in the mountains and of course it is very common in the valley districts. One of the most interesting bird experiences that I have had, has to do with this bird. On the night of June 23, 1919, near the Imnaha postoffice, hundreds of Nighthawks flew about over the Imnaha River at sun-down. There were such great numbers of them that the booming noise produced by their wings was almost continuous. I have never seen so many Nighthawks in one place as there were here at this time.

Chaetura vauxi. VAUX'S SWIFT.—Mr. Jewett reported seeing two on Big Sheep Creek on August 31, 1919. I saw two on the forks of the Imnaha on July 28, 1920, and several of them at College Creek Ranger Station, May 26, 1921.

Selasphorus platycercus. BROAD-TAILED HUMMINGBIRD.—One individual was noted along the railroad near Enterprise on July 27, 1921. Mr. Jewett and I watched it for some time as it flew about from flower to flower.

Selasphorus rufus. RUFOUS HUMMINGBIRD.—The Rufous Hummingbird was noted at Enterprise on May 25, 1921, and in Imnaha Canyon on May 26, 1921.

Stellula calliope. CALLIOPE HUMMINGBIRD.—This is a common Hummingbird of the mountain districts of Wallowa County. I have seen it on every trip into the mountains.

Tyrannus tyrannus. KINGBIRD.—The eastern Kingbird is fairly common in the county. It is quite abundant in the Imnaha Canyon and I have in addition seen it at Wallowa and Enterprise on the 24th and 25th of May, 1921. As with so many other eastern birds it enters this county by way of the canyons of the Snake and Imnaha Rivers.

Tyrannus verticalis. ARKANSAS KINGBIRD.—This bird is much more abundant than is the Kingbird, and is one of the most conspicuous summer residents of the county. At Wallowa on May 24, 1921, I saw a nest with four well-grown young, conspicuously located on the cross-piece of a rather low telephone pole, directly in front of a residence.

Sayornis sayus. SAY'S PHOEBE.—One pair noted at Enterprise, February 28, 1920.

Nuttallornis borealis. OLIVE-SIDED FLYCATCHER.—The Olive-sided Flycatcher is abundant in the higher mountain districts of the county. To me it is one of the most typical of mountain birds, and its wild, free call notes seem to be decidedly appropriate to the rough country which it inhabits in this district.

Myiochanes richardsoni richardsoni. WESTERN WOOD PEWEE.—This is one of the most common of all the smaller Flycatchers of the district. I noted it nesting in the Wallowa Valley and also saw it at Lick Creek Ranger Station on July 27, 1920. It is very common in the Wallowa Valley.

Empidonax trailli trailli. TRAILL'S FLYCATCHER.—Small Flycatchers of this genus are very common in this district. However, one killed at Stanley Ranger Station, July 22, 1920, is the only one I can positively identify.

Otocoris alpestris arcticola. PALLID HORNED LARK.—This subspecies of Horned Lark is a common winter visitant. While here these birds mingle with the Dusky Horned Larks, which are year-around residents. They were noted commonly during my visit in February, 1919, and also in 1920, and could easily be picked out by their larger size and paler color.

Otocoris alpestris merrilli. DUSKY HORNED LARK.—This is a very abundant resident of the county. It is found throughout the summer in the Wallowa Valley and in the hills adjacent to it, and in winter the immense flocks of this species and the Pallid Horned Lark form the most conspicuous bird life of the open country. They are sometimes present in flocks of tens of thousands, roaming over the open parts of the county.

Pica pica hudsonia. MAGPIE.—The Magpie is a common bird of the Wallowa Valley.

Cyanocitta stelleri annectens. BLACK-HEADED JAY.—This Jay, which indicates the Rocky Mountain character of the fauna of this district, is very abundant, both in the fir thickets that are found along the Wallowa River, and in the mountain country. Winter and summer alike its top-knot can be seen peering down at one through the branches of the trees. Like all Jays it is exceedingly curious and at the same time shy. It can be a decided nuisance at times when one is trying to see other species of birds. When attempts are being made to "sneak" birds it is one of the first to respond and the last to leave.

Perisoreus canadensis capitalis. ROCKY MOUNTAIN JAY.—This bird is common throughout the mountain sections of the county. It has

all the characteristics of other Jays of the group and is known by the name of "Camp Robber" or "Whisky Jack" in this district, as its relatives are elsewhere.

Corvus corax sinuatus. RAVEN.—One individual noted at Wallowa, March 9, 1920, and a pair near College Creek Ranger Station, May 26, 1921. This pair probably were nesting on the cliffs along the Imnaha, as they were seen several times during the day and again the next morning.

Corvus brachyrhynchos hesperis. WESTERN CROW.—The Crow is not so abundant in this district as in other parts of Oregon, but it is present in large enough numbers to be seen on practically every visit to the county.

Nucifraga columbiana. CLARKE'S NUTCRACKER.—The Nutcracker is one of the most conspicuous and abundant birds of the mountain country. It is found wherever suitable conditions prevail and, while I have noticed it at the mouth of the canyons where the streams break out into the Wallowa Valley, I have never noted any of them in the valley, even in the most severe weather.

Dolichonyx oryzivorus. BOBOLINK.—Mr. Jewett noted the Bobolink in the Wallowa Valley on July 12, 1912. These birds are now well established in fields adjacent to Wallowa and in July, 1920, and July, 1921, I noted a number of individuals. This is one of the eastern birds which is apparently moving westward and is becoming well established in Oregon, not only in this valley but in other localities.

Agelaius phoeniceus neutralis. SAN DIEGO RED-WING.—Great flocks of migrating Blackbirds are present late in February and early in March, and smaller numbers nest in suitable localities throughout the county. I have noted nesting birds in the small swamps near Enterprise, May 25, 1921; and one at Wallowa, May 24, 1921, and July 21, 1920; and in the Imnaha Canyon, June 23, 1919, and May 26, 1920. Suitable territory for Red-wings is not extensive in Wallowa County and therefore this is not a common nesting bird.

Sturnella neglecta. WESTERN MEADOWLARK.—Meadowlarks are an abundant species of the valley. They are also quite common in the higher mountain sections. I doubt very much whether any other bird exceeds them in abundance. A few may winter, as I have seen individuals on February 10, at Wallowa, at which time there was no evidence of any migratory movements.

Icterus bullocki. BULLOCK'S ORIOLE.—Not very abundant. Individuals were noted at Imnaha post office, June 23, 1919, and May 26, 1921; and a pair at Wallowa, May 24, 1921.

Euphagus cyanocephalus. BREWER'S BLACKBIRD.—A very common migrating bird and a quite common summer resident. Flocks of young ones were very much in evidence in July, 1920, during my visit to the county.

Herperiphona vespertina californica. CALIFORNIA EVENING GROSBEEK.—The Evening Grosbeak is a common bird of the mountain districts. I have found it on every trip into the mountains in all parts of the county.

Specimens agree very closely with those from the Warner Mountains, Lake County, which have been described by Grinnell as *H. v. californica*.

***Pinicola enucleator montana*.** ROCKY MOUNTAIN PINE GROSBEEK.—Two individuals, neither one of them with rosy plumage, were noted near the edge of town of Wallowa, March 1, 1919. One was shot and is now in S. G. Jewett's collection.

***Carpodacus cassini*.** CASSIN'S PURPLE FINCH.—One of the most abundant and familiar birds of the mountain districts. I have seen them feeding commonly with the Crossbills and Grosbeaks around salting stations in the mountains.

***Carpodacus mexicanus frontalis*.** HOUSE FINCH.—Not very common in Wallowa County. I saw one single House Finch in front of the hotel at Enterprise, February 21, 1919, and have noted them at Enterprise, April 15, 1921; and Wallowa, July 21, 1920.

***Loxia curvirostra minor*.** CROSSBILL.—Common resident of the higher mountain country, and in some winters abundant in the Wallowa Valley. I saw considerable numbers of them in February, 1919, between Wallowa and Enterprise.

***Leucosticte tephrocotis littoralis*.** HEPBURN'S ROSY FINCH.—A very abundant winter resident of the open country north of Enterprise and Wallowa. I have seen them in large flocks on some days, while on others I have traveled for hours without seeing any. They were particularly abundant in February, 1919, and February and March, 1920.

***Astragalinus tristis pallidus*.** PALE GOLDFINCH.—An abundant resident of the county in the winter. Small compact flocks are common along the heavily timbered bottom of the Wallowa River, while during the summer they are present everywhere in the county.

***Spinus pinus*.** PINE SISKIN.—The Pine Siskin is another very abundant resident bird of the district.

***Plectrophenax nivalis nivalis*.** SNOW BUNTING.—A common winter resident. These, with the Rosy Finches and the immense flocks of Horned Larks, comprise the great bulk of the winter bird population of the open country of Wallowa County.

***Poecetes gramineus confinis*.** WESTERN VESPER SPARROW.—Very abundant summer resident of the Wallowa Valley. Also one of the common summer residents of the Imnaha Canyon.

***Passerculus sandwichensis nevadensis*.** NEVADA SAVANNAH SPARROW.—A quite common resident of the Wallowa Valley.

***Chondestes grammacus strigatus*.** WESTERN LARK SPARROW.—A number of them were noted in the Imnaha Canyon on May 26, 1921. This bird does not seem to be so common in Wallowa County as in other parts of eastern Oregon.

***Zonotrichia leucophrys leucophrys*.** WHITE-CROWNED SPARROW.—This Sparrow was found breeding commonly around Stanley Ranger Station, July 22, 1920, and Minam Lake in July, 1921.

***Spizella monticola ochracea*.** WESTERN TREE SPARROW.—A con-

siderable flock was found in the edge of town at Enterprise, February 18, 1919. It is my only record for the county.

***Spizella passerina arizonae*.** WESTERN CHIPPING SPARROW.—An abundant summer resident throughout the county.

***Spizella breweri*.** BREWER'S SPARROW.—I was surprised to find this bird to be a common resident in the scattering bunches of sage-brush on the ridge between the Imnaha and Snake Canyons. It was common on the southern slopes which had a scattering growth of sage-brush, at Memaloose Ranger Station, and also near the Lick Creek Ranger Station. It was also a common resident of the Imnaha Canyon.

***Junco hyemalis connectens*.** SCHUFELDT'S JUNCO.—This is the breeding form of the Junco in this district. It is a very abundant species. Specimens from Enterprise have been identified by Dr. H. C. Oberholser.

***Junco hyemalis montanus*.** MONTANA JUNCO.—A number at least of the winter birds of Wallowa County are of this subspecies. They are much grayer than the summer breeding bird. Winter specimens from Wallowa in Mr. Jewett's collection are clearly *montanus*.

***Melospiza melodia montana*.** MOUNTAIN SONG SPARROW.—An abundant permanent resident found both in the valley and in the mountains in numbers wherever suitable nesting sites prevail. This Song Sparrow is also a common winter resident of the Wallowa Valley.

***Melospiza lincolni lincolni*.** LINCOLN'S SPARROW.—Mr. Jewett noted them at Aneroid Lake, August 22, 1912. There were several pairs noted on July 26, 1921, near a sheep camp about 12 miles north of Wallowa.

***Passerella iliaca schistacea*.** SLATE-COLORED FOX SPARROW.—This bird is common about Enterprise in migration in April and is a familiarly common breeding species of the mountain districts. I found it common about Memaloose Ranger Station, June 20 to 22, 1919; about Stanley Ranger Station, in July, 1920 and 1921; and at Minam Lake, July, 1921; and on the head-waters of the Imnaha, in July, 1921.

***Pipilo maculatus montanus*.** SPURRED TOWHEE.—A summer resident bird recorded from the ridge between the Snake and Imnaha Canyons, June 20, 1919; and from the Imnaha Canyon, May 26, 1921.

***Zamelodia melanocephala*.** BLACK-HEADED GROSBEEK.—This bird is not so common in Wallowa County as in other parts of eastern Oregon. My only record is of one individual, a male, seen at the Imnaha postoffice, June 23, 1919.

***Passerina amoena*.** LAZULI BUNTING.—A very common summer resident of the Wallowa Valley.

***Piranga ludoviciana*.** WESTERN TANAGER.—A very common summer resident of the mountain districts of the county. In May, 1921, great numbers of these birds in migration were present around Wallowa. I have never seen any species more abundant through the trees and bushes, except in some of the Warblers in migrations in the Mississippi Valley.

***Petrochelidon lunifrons lunifrons*.** CLIFF SWALLOW.—Common summer resident of the county. In the Imnaha Canyon on June 23,

1919, I found a considerable colony with their nests plastered on a large cliff. At Wallowa on May 24, 1921, and near Enterprise, May 25, 1921, I saw two colonies with their nests built on the sides of the buildings as is usual with these birds in eastern states.

Hirundo erythrogastra. BARN SWALLOW.—Common summer resident of the Wallowa Valley.

Tachycineta thalassina lepida. NORTHERN VIOLET-GREEN SWALLOW.—Common summer resident both in the mountains and valley.

Riparia riparia. BANK SWALLOW.—Mr. Jewett reports Bank Swallows from Minam, July 12, 1916.

Stelgidopteryx serripennis. ROUGH-WINGED SWALLOW.—I found Rough-winged Swallows to be abundant about Wallowa and around Bear Creek in June, 1919, and quite common in the Imnaha Canyon, June 23, 1919, and May 25, 1921.

Bombycilla garrula. BOHEMIAN WAXWING.—Bohemian Waxwings had always been a rather rare and unusual bird in my experience until I first visited the Wallowa Valley on February 18, 1919. During the two weeks following this date while I remained in the county, I saw literally tens of thousands of these Waxwings. Every place we went in the wooded portions of the valley there were great flocks feeding on the various berries and seeds that had remained on the trees. Again, in February, 1921, I saw the same sight. They were, in both of these months, by far the most abundant bird in the district. I have not seen them in Wallowa County at any other time.

Bombycilla cedrorum. CEDAR WAXWING.—A common summer resident of the county. A nest with three nearly fledged young was noted in Wallowa, July 21, 1920. A flock of several hundred was noted on June 23, 1919, feeding in a cherry orchard near the Imnaha post office. A small flock, evidently of wintering birds, was noted at Lostine, February 20, 1919, in company with a much greater number of Bohemian Waxwings.

Lanius borealis. NORTHERN SHRIKE.—One individual noted at Wallowa, February 28, 1919.

Vireosylva gilva swainsoni. WESTERN WARBLING VIREO.—A very common summer resident of the Wallowa Valley and of the creek bottoms in the mountains.

Lanivireo solitarius cassinii. CASSIN'S VIREO.—Noted at Lick Creek Ranger Station, July 27, 1920, and in the Imnaha Canyon, May 26, 1921.

Vermivora celata lutescens. LUTESCENT WARBLER.—One noted at Lick Creek Ranger Station, July 27, 1920.

Dendroica aestiva aestiva. YELLOW WARBLER.—A very common breeding bird of the Imnaha Canyon and less common along the Wallowa River in the main valley.

Dendroica auduboni auduboni. AUDUBON'S WARBLER.—Common breeding bird of the mountains.

Oporornis tolmiei. MACGILLIVRAY'S WARBLER.—Several noted on the College Creek Ranger Station, May 26, 1921.

Icteria virens longicauda. LONG-TAILED CHAT.—A common bird in the Imnaha Canyon. Noted on June 23, 1919, and May 26, 1921. This is another bird that finds its way into the county through the canyons of the Snake and Imnaha Rivers.

Setophaga ruticilla. REDSTART.—Mr. Jewett reports one from Minam, July 12, 1916.

Cinclus mexicanus unicolor. DIPPER.—An abundant resident of all the mountain streams of the district. One of the most interesting sights from the Railway train on a trip up the Wallowa Canyon is to see the Dippers fly back and forth across the river and to watch their activities.

Dumetella carolinensis. CATBIRD.—Mr. Jewett reports Catbirds from Enterprise on July 13 and 14, 1916. I have seen them in Wallowa, July 21, 1920, and at Imnaha postoffice, July 23, 1919. The Catbird seems to be an increasingly common bird in northeastern Oregon.

Salpinctes obsoletus obsoletus. ROCK WREN.—I found the Rock Wren to be fairly common in the Snake River Canyon, June 20, 1919. I also saw several in the Imnaha Canyon, May 26, 1921.

Troglodytes aëdon parkmani. WESTERN HOUSE WREN.—Noted only two in the county, one at Lick Creek Ranger Station, July 27, 1920, and one at Imnaha postoffice, June 23, 1919.

Nannus hiemalis pacificus. WESTERN WINTER WREN.—Noted in the timber along the river at Wallowa, February 28, 1919, and in similar places near Enterprise, March 6, 1920.

Certhia familiaris montana. ROCKY MOUNTAIN CREEPER.—A common bird in the timbered sections of the county. It has also been noted along the Wallowa River, at Enterprise, on March 7, 1920.

Sitta carolinensis nelsoni. ROCKY MOUNTAIN NUTHATCH.—One individual noted along the river near Enterprise on March, 7 1920, is the only record that I have for the county, but it is undoubtedly much more common. Specimens in the Jewett collection are clearly of this form.

Sitta canadensis. RED-BREASTED NUTHATCH.—A common species in the mountain sections of the county.

Sitta pygmaea pygmaea. PYGMY NUTHATCH.—An abundant resident of the yellow pine districts in the mountains.

Penthestes atricapillus septentrionalis. LONG-TAILED CHICKADEE.—Abundant throughout the county wherever suitable conditions are found.

Penthestes gambeli gambeli. MOUNTAIN CHICKADEE.—Abundant in the mountains throughout the year and fairly common along the Wallowa River in the valley during the winter months.

Regulus satrapa olivaceus. WESTERN GOLDEN-CROWNED KINGLET.—An abundant winter resident of the Wallowa Valley.

Regulus calendula calendula. RUBY-CROWNED KINGLET.—Noted at Stanley Ranger Station, July 22, 1920, and at Lick Creek Ranger Station, July 26, 1920.

Myadestes townsendi. TOWNSEND'S SOLITAIRE.—Abundant in the Wallowa Valley in winter. Less common in the mountains during summer.

Hylocichla guttata auduboni. AUDUBON'S HERMIT THRUSH.—One was found at Lick Creek Ranger Station, July 27, 1920.

Planesticus migratorius propinquus. WESTERN ROBIN.—A very abundant summer resident throughout the county.

Ixoreus naevius meruloides. NORTHERN VARIED THRUSH.—A common bird of the mountain districts of the county. It is particularly abundant about Stanley Ranger Station and adjacent districts.

Sialia mexicana occidentalis. WESTERN BLUEBIRD.—A fairly common migrant and summer resident, particularly of the Wallowa Valley and Innaha Canyon.

Sialia currucoides. MOUNTAIN BLUEBIRD.—An abundant summer resident of the mountain districts.

Portland, Oregon.

EXTENSION OF RANGE OF THE ROBIN AND ARKANSAS KINGBIRD IN OKLAHOMA.

MARGARET MORSE NICE.

WITHIN the last fifteen or twenty years Robins have been extending their breeding range westward in Oklahoma, and more recently Arkansas¹ Kingbirds have been moving eastward. Since little has been published on the ornithology of this State it is difficult to get definite dates especially in regard to the first nesting of the Robin in various localities; but, thanks to the courtesy of several correspondents and also of the United States Biological Survey who kindly sent me copies of migration records and reports of their investigators in this region, I have been able to gather a number of facts. (Unless otherwise stated my authority is that of the Biological Survey reports.)

The earliest record of the Robin in the State is given by W. W. Cooke² who found it a winter resident in 1883-4 in Caddo in southern Oklahoma; this is still its status in Bryan County. The first mention of its breeding was made by Mr. E. A. Preble who in 1892 stated that it "breeds sparingly" in Pittsburgh County in eastern Oklahoma. In central Oklahoma, in 1890, Robins were transients only at Fort Reno (J. C. Merrill), but now are common

¹ While conforming to the A. O. U. Check-List in the use of this name we contend that Western Kingbird is in every way more appropriate.

² 'Auk,' 1914, XXXI, p. 493.

breeders (J. C. Melton); in 1905 they did not breed at Minco,¹ whereas we found them nesting there in 1923. Mr. U. B. Worcester gives the only definite date of the first breeding of this bird in any locality in the State—in 1908 in Enid. In western Oklahoma, they were winter visitants only in 1904 in Custer County (G. E. Stilwell), but were nesting in 1911 (R. O. Whitenton); in 1905 they were not reported from July 13–23 at Woodward, while we found them breeding in 1922; in 1901 they were not seen in Alva from Aug. 3–7, but nested in small numbers in 1908.²

Robins are now distributed as breeding birds over most of Oklahoma except the extreme west, the southwest and south central portion. We saw five of these birds in the southeastern corner of the State—McCurtain County—on June 28 and July 1 and 2, 1923; (one of these was collected and was identified by Dr. H. C. Oberholser as *Planesticus migratorius migratorius*). The only others we have seen south of the South Canadian River in summer from 1920 to 1923 have been one or two individuals in Latimer, Leflore, Murray and Caddo Counties and several in Grady County. Mr. Frank Rush reports Robins as breeding at Hobart in Kiowa County. At Gate in Beaver County on the 100th meridian they are “regular but not common migrants” according to Mr. W. E. Lewis.

The advance of the Arkansas Kingbird has been more recent than that of the Robin and is in active progress at present; our data therefore are more extensive. The first record of this bird for the State was given by C. A. H. McCauley,³ who saw it in the spring of 1876 in northwestern Oklahoma. In 1901 it does not seem to have been a breeder in the main body of the State, for it is not mentioned in the Biological Survey report from Alva from Aug. 3–7 of that year nor had it been collected by Dr. A. H. VanVleet⁴ or Mr. C. D. Bunker although they made an extensive field trip during that summer to the southeastern corner of Oklahoma; now it has spread over the western half of the State.

¹ Wetmore. 1918 and 1920. 'Wilson Bulletin,' XXX, pp. 2–10, 55–61; XXXII, pp. 93–94.

² Carter and Trenton. 1908. 'The Northwestern,' I. 3, pp. 11–16.

³ 'Bul. U. S. G. and G. Surv. Tex.' 1877. III. pp. 655–695.

⁴ 'Second Biennial Report Dept. Geol. and Nat. Hist. Terr. of Olka.' 1902, pp. 161–166.

It would seem to have come first into northwestern Oklahoma; in 1908 it is listed as breeding at Alva;¹ Mr. Wm. Bayliff first noted a nesting pair in Alfalfa County in 1916, while Mr. U. B. Worcester writes that they first nested in Enid "ten years ago and each year become a little more plentiful."

We have no information as to southwestern Oklahoma until 1920, when on a trip to Comanche County we saw one bird, June 15. In early July, 1923, we went for the first time to the southwestern corner of the State and found a few of these Kingbirds in Harmon, Jackson, Tillman and Stephens Counties. Mr. R. L. More of Vernon, Texas (eight miles south of the Red River, opposite Tillman County), reports that this bird "is now (1923) a common breeder while five years ago was about the first nest in the county."

As to central Oklahoma, in Payne County they still occur as transients only according to Prof. R. O. Whitenton. In Kingfisher they were summer residents at the time of our first visit there in 1920. Dr. A. Wetmore² did not find them at Minco, Grady County, in 1905, but on May 20, 1923 we observed four, one of which was building a nest on a telegraph pole. Mr. E. D. Crabb informs me that 1916 was the first year in which he saw these birds in Canadian County, while now they breed there. Their arrival in Cleveland County has been even more recent. The first Western Kingbird that we observed here was one individual on Aug. 29, 1919. During the next two years single birds were seen on May 8 and 18, 1920 and May 11 and 24, 1921. In 1922 one was seen May 13, and two pairs appeared to have summered in the vicinity for they were seen through June and July, one three miles east of Norman and another five miles west. In 1923, the first arrival was noted April 29, the second May 6; the following pairs seem to have been established by farm houses, being seen from late May through July; two in the same localities as the previous year, one seven miles west, one, one mile west, one four miles north, while one settled in Norman, the nest being found in a Russian mulberry, June 4.

In June, 1923, we saw single birds while driving through McClain

¹ Carter and Trentoon. *Loc. cit.*

² *Loc. cit.*

and Garvin Counties. If *Tyrannus verticalis* keeps up this progress it may eventually reach Arkansas!

As yet Western Kingbirds have not become common in any place that we have visited in the main part of the State; (we have not been in the central western counties; Prof. Whitenton did not find them in Custer County in 1913). Mr. W. E. Lewis writes that at Gate they are "common migrants, some nest." In the western part of the Oklahoma Panhandle, in Texhoma and Kenton, and also in Liberal, Kansas, and Clayton, New Mexico, they are abundant, being the chief "song bird" in all these towns except Kenton which is blessed with Bullock's Orioles and Western Meadowlarks. In late May just before daybreak these Kingbirds raised quite a chorus, apparently as satisfying to them as something musical would have been.

The Robins had the start of the Kingbirds for trees grew faster in fairly well-watered central Oklahoma than in the semi-arid regions along the western border. It seems as if now the Robins are increasing their numbers in the localities they have already adopted rather than making further advances west; at any rate they have nested in Alva for at least fifteen years but have not spread to Gate. It will be interesting to see what the Kingbirds do—extend their range to the east or multiply in the towns where they already are. It is pleasant that civilization has some compensations; while many kinds of birds disappear, others thrive and increase.¹

Norman, Oklahoma.

¹ We have some evidence that Brown Thrashers, Catbirds and Bullock's Orioles have recently extended their ranges; the two former birds were not found by Dr. Wetmore in Minco in 1905, but were there May 20, 1923; the last was not recorded by Dr. VanVleet in southwestern Oklahoma in 1901, but was breeding there in 1923.

THE GREAT GROSBKAK YEAR.

BY J. K. JENSEN.

THE winter of 1922-23 will go down in the annals of New Mexico as the year of many Grosbeaks, and in saying this I refer to the Western Evening Grosbeak (*Coccothraustes vespertinus montanus*).

Grosbeaks may be seen occasionally every year; as a rule only for a few days during spring or fall, and only few in number. During the winter mentioned above great flocks were in evidence from October 30, 1922 until May 1, 1923, and from then until June 1 a few birds were occasionally encountered.

At the United States Indian School, where most of my observations were made, we had flocks almost continually of from fifty to three hundred birds. In Santa Fé proper there were several flocks of from one hundred to five hundred, while smaller flocks of from four to a dozen birds could be seen at any time in almost every shade tree. In the towns and cities near Santa Fé similar flocks could be seen; in Tesuque, Pojaque and Nambe to the north, and in Domingo, Bernalillo and Albuquerque to the south, and even as far away as Silver City, so it is reasonable to assume that the same condition prevailed all over the State.

The first birds arrived October 30, 1922. My few notes on the appearance of the Grosbeak follow:

October 30, 1922.—Today a flock of Western Evening Grosbeaks arrived at the Indian School campus. There must be between two hundred and three hundred birds, or more than I have ever seen together. The Grosbeaks are also numerous in the "Willows" along the Santa Fé River and in the city.

November 3, 1922.—Today I counted eighty-seven Grosbeaks in a small box elder on the campus.

November 12, 1922.—November 10th all the birds seemed to have disappeared, but today some are back, and flocks of four to fifty birds are continually to be seen.

December 3, 1922.—Between November 12 and December 3 the Grosbeaks have been very numerous at the campus in flocks

of from ten to three hundred birds. I succeeded, with the help of a pullstring trap, in catching and banding seven birds. The birds are very tame and several times when the trap was sprung and a bird was caught, both the bird in the trap and those outside would continue feeding as if nothing had happened. Often I can walk to within ten feet of the feeding flock, and usually when I go to reset the trap the birds will fly to the trees and watch from a distance of only a few feet.

Four birds I kept in a cage for a few days, awaiting a shipment of bands, would flutter some when I came close to the cage, but as soon as they were left in peace they would eat and drink and call to each other just as the free birds did.

December 29, 1922.—Not a day has passed but what flocks of Grosbeaks have been here; sometimes only four to twelve, but as a rule a large number, at times exceeding three hundred birds. They usually spend their time in or under the box elder trees, which had a large amount of seeds this year.

January 10, 1923.—The Grosbeaks are still here in large numbers. During the last week a flock of from fifty to fifty-five birds have been feeding on my lawn.

January 17, 1923.—The Grosbeaks are still here.

February 2, 1923.—The Grosbeaks are still here in large numbers.

March 17, 1923.—The Grosbeaks are still here in numbers. They are now feeding more often on the ground under the box elder trees than in the trees, probably because most of the seeds have fallen.

March 18, 1923.—The Grosbeaks are still here.

April 15, 1923.—A few Grosbeaks still remain. The birds now feed on the swelling buds of the trees. They seem to prefer maple buds.

May 16, 1923.—Only a few birds now remain. They are now only seen in twos and threes, and stop only for a short time.—My notes end here.

The birds were all gone by June 1, which is natural, as the breeding season appears to commence during the first week of June. During May I did not succeed in trapping any birds, because their food now kept them in the treetops, and they were never seen on the ground.

In all I banded thirty-two birds, and so far as I know, only three of these repeated, but they may have strength enough in the bill to pull off a soft aluminum band. The three birds recaptured had the bands so battered and bent that I had to remove them in order to straighten them and then replace.

The birds, while docile in the trap, became furious, when I tried to take them from the gathering cage. They would utter a very wild and fierce scream and bite and claw. Quite frequently a bird would drop on its back in the gathering cage and use both bill and feet in defense, and they are really no mean antagonists; on many occasions their bites have drawn blood from my fingers and hands.

After the bands were placed the birds seemed to become quiet and almost sluggish, and often one would lay for several minutes on my open palm before it realized it was free to leave. Then generally it would fly to a nearby tree and call to the flock from which it was taken.

The birds fed mainly on the seeds of the box elder. As long as plenty of food remained on the trees they would sit as close as apples on a tree, and with a Parrot-like motion reach for the seeds which were shelled and eaten, the shells being dropped. During the latter part of the winter they were seen more often feeding on the ground under the trees. The seeds of the black locust seemed also to tempt them, and along in the spring the buds of the trees served as a menu. The few birds I occasionally was forced to hold in captivity for a few days would eat wheat, although it did not seem to appeal to them much.

On the ground they would feed in compact flocks, and I have had as many as four at a time in a small pullstring trap. I always set the trap where I saw a flock feeding. The birds would fly to the trees while I set the trap, and as soon as I left, they would alight in the same place.

In the flocks were many beautifully colored males, there being something like one old male to every three birds. The greater number, however, were females and young.

Why the birds should be here in such large numbers as never before in the memory of the oldest inhabitants here is something I'm not prepared to explain. The most plausible thing might

possibly be scarcity of their natural food supply in the mountains, probably caused by the extended drought of the summer of 1922.

*U. S. Indian School,
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FURTHER NOTES AND OBSERVATIONS ON THE BIRDS
OF HATLEY, STANSTEAD COUNTY, QUEBEC,
1919-1923.

BY HENRY MOUSLEY.

In my last paper in 'The Auk,' Vol. XXXVIII, 1921, No. 1, pp. 51-59, I find the latest date recorded was October 31, 1919, when flocks of Tree Sparrows which arrived on September 26 were still about. Since then the following twelve species, Mourning Warbler, Horned Grebe, White-winged Scoter, Surf Scoter, Scaup Duck, Bohemian Waxwing, Starling, Rough-legged Hawk, Double-crested Cormorant, Mallard, Bufflehead, and Palm Warbler, have been added to my list, bringing the total up to 187 species to date. These will be dealt with hereafter in an annotated list as before. Continuing from where I left off in October, 1919, I propose to record just a few of the most interesting events under the heading of each month, as follows, viz.:

November, 1919.—On the 5th, the first flock of Redpolls appeared, followed on the 9th by Snow Buntings. On the 16th, a Goldfinch was seen, and the following day a Northern Shrike, the only one recorded for the winter. Mr. Greer saw what he took to be a flock of Herring Gulls on the St. Francis River at Sherbrooke on the 21st, and five days later, large flocks of Canada Geese and Snow Buntings were seen at Hatley.

December.—A Robin was seen by Mr. Greer's brother on the 4th, at North Hatley, and Pine Grosbeaks by Mr. Greer and myself on the 14th and 15th. The former also saw a Song Sparrow round his barn on the 21st, which was kept under observation until the 27th, when it disappeared, and was not seen again. Three more Robins were recorded on the 23rd, quite close to my house, and Mr. Harrison F. Lewis wrote me that he had seen

three on the 26th at Bergerville, near Quebec, so it looks as if a number of the birds had remained through the winter in this Province, the same as they did in Nova Scotia in 1917-1918, as recorded by Mr. Lewis in 'The Auk,' Vol. XXXVI, 1919, No. 2, pp. 205-07.

January, 1920.—On the 16th, a flock of twenty Evening Grosbeaks was reported, and I heard a Chickadee utter the so-called love note "Phe-be," with the thermometer registering 20° below zero! On the 22nd, Mr. Greer saw a Merganser on an open patch of water on the River Massawippi at North Hatley, and a Robin on the 27th near the same place. On the 28th, three Evening Grosbeaks were seen by my younger son.

February.—Mr. Greer again reported the Merganser as being at North Hatley on the 8th, and on the 27th, he saw a Robin there, and Evening Grosbeaks were also seen by his son. From the 15th to the 19th, Pine Grosbeaks regularly visited my garden. On the 23rd, I saw a Crow at Ayer's Cliff, and was informed the bird had spent the winter in the neighborhood, notwithstanding the fact that the thermometer seldom registered much above zero. On the 24th, I saw the first Prairie Horned Lark.

March.—On the 5th, the worst snowstorm of many years commenced, and lasted all through the following day and night, the high wind piling the snow up into great drifts, and causing a dislocation of traffic both by road and rail, the thermometer at the time registering from zero to 10° below. It was not until the 10th that a decided thaw set in, and Crows were heard cawing in all directions. On the 28th, a couple of Black Ducks were seen on "the marsh," this record being nine days ahead of any previous one. A flock of fifty Canada Geese was reported on the 29th.

April.—Nothing of any great interest occurred during the month.

May.—Warblers were late in arriving, the Yellow Palm failing to put in an appearance at all. The first Myrtles appeared on the 7th, followed at intervals by most of the other species to be found here. Canadian Ruffed Grouse did well, a nest with eleven incubated eggs being found on the 25th, and three broods of chicks were seen between this date and June 10.

June.—Two small Gulls, probably Kittiwakes, were seen on Lake Massawippi on the 5th, and on the 12th, I came across a

female Indigo Bunting on the western shore, which from her actions was evidently breeding. This bird is uncommon here, and I have only once found their nest and eggs, in 1912. On the 14th, I found the Yellow-bellied Flycatcher breeding for the first time, full particulars of which appeared in 'the Auk,' Vol. XXXVIII, 1921, p. 127. They have been particularly numerous this season. On the 19th, my younger son saw four Great Blue Herons, an unusual event, as I have no previous record for the month of June. The 22nd brought a pleasant surprise, for I came across a singing male of the Bay-breasted Warbler, not five hundred yards from the site of the nest found in 1918. On this occasion, however, I failed to locate his home, and did not see the bird again in this particular spot, but found him on July 2, on the very same ground as in 1918, but no amount of searching revealed any nest, the bird being probably mateless, as no female was seen on either occasion. On the 24th, a Bartramian Sandpiper was seen, as recorded in 'The Auk,' Vol. XXXVIII, 1921, p. 126. On this date also, a Brown Creeper was seen in the big swamp near Beebe, this bird never having been recorded before between May 25 and August 2 in any given year. Warbling Vireos were seen frequently, a pair nesting in my garden again as last year, and within a few yards of the old site.

July.—On the 1st, I looked up my little pair of House Wrens, and found they had nested again in the old locality, for both parents were feeding their brood of five young. The notes of the Olive-sided Flycatchers, which also nest in this locality, were heard, but all my attention was taken up by a singing male Scarlet Tanager, whose nest is still a desideratum, the bird being scarce in these parts. However, nothing came of it, as I failed to locate either a nest or a female. On the 2nd, I found a nest of the Myrtle Warbler, containing four fresh eggs, and on the 9th, one of a Magnolia Warbler, also with four fresh eggs, both of which I consider genuine second sets, and not brought about by the loss of the first, or even any subsequent set. The nests were within nine yards of each other, and the set of eggs in the former must be about the smallest on record, their average size being only $.63 \times .50$, the extreme given in 'Warblers of North America' being $.63 \times .51$.

On the 6th, I definitely added the Sharp-shinned Hawk to my breeding list, by finding a nest situated about forty-five feet up in a tall spruce tree, and which contained four young birds. The female was very noisy and demonstrative, but the male was quiet and unobtrusive. He was in full adult plumage, whilst his mate was in a phase half way between that of adult and immature. The return of the Solitary Sandpiper, on the 15th, reminded me forcibly that the summer was on the wane. Two days later, a Wilson's Snipe was flushed on "the marsh," this bird never having been noted before in July, the earliest previous record being August 24 of last year, 1919.

August.—On the 1st, an immature Mourning Warbler was secured by my friend, L. M. Terrill, on Mt. Orford, bringing my list of Warblers up to twenty-four species, see 'Auk,' Vol. XXXVIII, 1921, p. 126. On the 16th, a Lesser Yellow-legs was seen on "the marsh," the last record dating back as far as August 31, 1917. This bird was joined by another on the 18th, and with one seen on the 26th, 29th, and September 7, the total record for the past ten years stands at fourteen birds only.

September.—On the 3rd, a Cooper's Hawk was seen, and on the 9th a Wilson's Warbler, both uncommon birds here.

October.—On the 6th, I secured an example of the Pied-billed Grebe on the marsh, the first I had seen there, and also obtained my second record for the Green Heron, the last one dating back to September 24, 1917.

November.—On the 1st and 7th, two Horned Grebes were obtained on Lake Massawippi, see 'Auk,' Vol. XXXVIII, 1921, p. 126.

December.—A Robin was seen on the 4th and 5th, and another on the 12th by Mr. Greer; it was singing in a tree top near North Hatley. Goldfinches and Purple Finches were observed on the 9th and 10th, the latter wintering here for the first time, see 'Auk,' Vol. XXXVIII, 1921, p. 606.

January, 1921.—The first record for the year was a Purple Finch on the 3rd, and five more on the 15th, with five Goldfinches as well. A Crow was seen on the 29th and 30th.

February.—A Saw-whet Owl was killed in the barn of Mr. Glen Bean at North Hatley on the 13th.

March.—Prairie Horned Larks were first seen on the 2nd, and Bluebirds on the 12th, this being a record by eight days. For other early spring records during this and following months, see 'Auk,' Vol. XXXVIII, 1921, p. 609.

April.—A Killdeer was seen on the 5th, and a nest and four eggs of the Prairie Horned Lark was found on the 9th, this being a record by five days.

May.—On the 21st, I climbed Mt. Orford (2860 ft.) in company with my friends, Napier Smith and Colonel Morrill. On the summit a flock of White-winged Crossbills was seen, out of which a female was obtained. Mr. Smith had found these birds breeding near the mountain on April 12, a nest containing three young about two days old having been located, and some interesting photos obtained. One female Myrtle Warbler, and three or four Black-poll Warblers were also seen near the summit, and what looked like an old nest of the latter was discovered about four feet up in a stunted spruce. Other interesting birds, observed lower down the mountain, were the following. viz.: Mourning Warbler one, Rose-breasted Grosbeaks three, Scarlet Tanager one, and a Sharp-shinned Hawk, whose nest was evidently not far off. A nest of the Ovenbird was found all ready for eggs, this being an early date. In Mr. Smith's garden at Magog a Warbling Vireo's nest was seen, also one of the House Wren in a nesting box

On the 26th, a male Scarlet Tanager was seen in my garden, and on the 27th and 28th, I had the gratification of listening to the notes of the "Kicker." On both occasions these were heard on "the marsh" at 8 P. M., and were exactly as described by the late Wm. Brewster, Kic, Kic-Kic, Ki-Kèer. They were uttered regularly at short intervals, and kept up for long periods at a time. In view of my record of the Black Rail, 'Auk,' Vol. XXXVIII, 1921, p. 56, may I not, like Mr. Brewster, be allowed to ascribe these notes to this bird, until such time as the matter can be set at rest, in the way pointed out by Mr. Brewster, in his 'Birds of the Cambridge Region,' 1906, p. 148-149? On the 28th, a White-winged Scoter was seen on Lake Massawippi, and I heard that a pair of Purple Martins had attempted to breed in Mr. Austen Beaumont's Martin house, near Kingscroft on the 30th, but had been driven off by some Tree Swallows, who had taken up their

residence previously. Mr. Beaumont told me that Martins used regularly to occupy this house a few years ago.

June.—On the 4th, a male Indigo Bunting was seen near my house, and on the 6th, I was able to add the Brown Creeper to my breeding list, by finding a nest in a swampy wood on the eastern shore of Lake Massawippi, containing five fully fledged young, which all flew out directly I rapped the tree. The nest was situated behind the loose bark of a dead fir tree, fifteen feet above the ground, and was composed of coarse strips of bark, held together with spiders webbing, the lining consisting of soft material, such as animal fur, and very fine shreds of bark. Judging from the shape of the nest when I found it, the weight of the little birds had so elongated it, that finally they must have been lying in a tier, one above the other.

On the 12th and 13th, I found two nests of the Northern Parula Warbler, and another again on the 30th. One of these differed from any of the others found here, being suspended after the manner of a Baltimore Oriole's, and not constructed between two hanging strands of usnea lichen. It is remarkable that since May 12, until the 21st, of this month, I did not see a Hummingbird. On the last day of the month, I found the nest of a Redstart, containing one young Cowbird, and one young Redstart. The only other record of a Warbler being victimized dates back to June 27, 1915, when I found an egg in the nest of a Yellow Warbler as already recorded.

July.—A Solitary Sandpiper returned on the 6th, this being a record by three days, the previous earliest being July 9, 1916. On the 23rd, I left Hatley and did not return until the end of August.

August.—On the 31st, I saw seven Solitary Sandpipers all close together, a somewhat unusual sight. A Killdeer was also noted.

September.—On the 3rd, 5th and 8th, three other Killdeers were observed near the same spot as the one seen on August 31. Possibly they may have been one and the same bird, but in any event this species is gradually extending its range in the Province of Quebec. On the 5th, a Green-winged Teal was seen on "the marsh," the previous record dating back to 1916. Another was seen on the 14th, in company with a Blue-winged Teal, which

latter bird had only once previously been noted, in 1919. A Philadelphia Vireo was seen on the 16th, and on the 29th I beat my previous record by seeing eight Solitary Sandpipers all close together. Most of the Warblers were seen during the month, and the season can be compared to that of 1912 for the abundance of Warbling Vireos.

October.—In the early part of the month up to the 11th, the following Warblers were seen viz.: Nashville, Northern Parula, Black-throated Blue, Bay-breasted, Blackburnian and Myrtle. On the 5th, a large flock of Pipits was noted.

On the 12th, I left Hatley on a visit to England, and did not return until the following March.

December.—On the 14th, Mr. Napier Smith wrote me that a Great Blue Heron had been seen by two parties at Magog on the 1st instant, during a southwest gale. This is the latest record I have for the species, my latest previous being Nov. 27, 1916. In this same letter, Mr. Smith speaks of Owls being abundant especially the Short-eared, which showed a great individual variety of plumage colouration, dark, light and white-faced. On the 11th, Mr. Smith secured a Canada Jay, the second record only I have of the species, the previous one being October 21, 1915.

April, 1922.—On the 22nd, the first Myrtle Warbler was seen, beating all former records by four days, the previous earliest being April 26, 1913. On the 26th, I saw a pair of White-breasted Nuthatches carrying building material to a knot hole in a tall maple.

May.—Many records of early arrivals were obtained from the 1st to the 12th, in one case, that of the House Wren, being as much as eleven days in advance of any previous date. On the 12th, a Philadelphia Vireo was seen, this being the first spring record I have, all the others being in the fall. The day following was a "red letter" one, an example of the Palm Warbler being secured, and on the 14th, a beautiful nest with seven fresh eggs of the Brown Creeper was found near Lake Massawippi, in the same wood, and close to the one found last year on June 6, containing five fully fledged young. In the present instance, the site and construction of the nest was similar to that of last year, but this one was of course in perfect shape, and can be seen in the Victoria

Memorial Museum at Ottawa, to which institution I presented it. On the 19th and 20th, whilst staying with my friend, Mr. Napier Smith, at Magog, I had the pleasure of hearing and witnessing the love song and flight of the Woodcock, but no amount of searching revealed the nest. It was whilst looking for this nest, that we came upon a male Chickadee fast asleep in an old nest of a Red-eyed Vireo. Just previously, we had found the female sitting on seven eggs in an old stump nearby. So sleepy was the male, that he almost refused to leave the nest, and when he did, he merely stood on the edge of it, whilst we watched him at very close quarters. When we moved away, he again retired for the night, and so we left him. Speaking of the so-called love note "Phe-be" of the Chickadee, the following is a record of the total number of times I have heard it uttered, during the past eight years viz.: January 3 times, February 1, March 19, April 40, May 52, June 22, July 13, August 22, September 51, October 15 times, November and December nil. I think this record tends to show that the note is really a love one. During the four winter months, the birds hardly ever utter it, then in March it begins, and in April increases, and by May has reached its height, as might be expected. From thence there is a diminution, until we reach September, when there is another great increase, which however is in the natural order of things, and what one might expect.

Whilst at Magog, I also heard of a Crow carrying off sixteen young chickens, in a manner similar to that witnessed by myself near Hatley, and already recorded, 'Auk,' Vol. XXXIII, 1916, No. 1, p. 73. On the 27th, I found my first Song Sparrow's nest containing a Cowbird's egg, and four of the owners. On the ground at the side of the nest, the fifth egg of the Sparrow was found, with a hole "jabbed" in it, as if by the bill of the Cowbird. Do we know all that is to be known regarding the number of eggs the female Cowbird lays, and the exact time, and method of depositing them, in the nests of other birds? The subject should prove an interesting one to our Oölogists, in view of Mr. Edgar Chance's recent work with the Cuckoo in England, see 'The Cuckoo's Secret,' Edgar Chance, 1922, pp. 1-239. At Hatley, the Cowbird is an infrequent (but I am afraid somewhat increasing) visitor, for during the past twelve years, I have only come across three eggs,

and three young birds, two of the former being found this year, the one above, and the other in the nest of a Magnolia Warbler on June 9. On the 29th, at Lake Massawippi, I came across a Black Duck with her brood of six Ducklings, in a marsh on the eastern shore, not far from Massawippi Station.

June.—On the 8th, a Northern Water Thrush was observed feeding its young on the eastern shore of Lake Massawippi, and on the 9th, the Magnolia Warbler's nest was found, containing the Cowbird's egg referred to above. Two other very interesting nests, also of this species, were met with on the 14th and 16th, built in the forks of spiraea bushes, a most unusual site, as previous to this I have never found them in anything but coniferous trees. On the 11th, a nest of the Yellow-bellied Flycatcher containing four fresh eggs was found by Mr. Napier Smith, who was spending the day with me, this being my second record only of the species nesting here.

On the 13th, a "mock" nest of the Winter Wren was located, in which the male spent a good deal of time. The nest was situated five feet above the ground, in the roots of a large upturned tree. On the 16th, a male Rose-breasted Grosbeak was heard singing, and a Woodcock was flushed, a somewhat unusual thing, as the bird is very scarce here, and has never been seen in this month before. On the 26th, I climbed Mt. Orford (2860 ft.) for the third time, finding the nest of a Junco with five fresh eggs almost on the summit, where a Winter Wren was also singing. Lower down, an Olive-sided Flycatcher was observed, and on the way home a Great Blue Heron was seen, near Little Magog Lake.

July.—On the 6th, I climbed Barnston Pinnacle (2150 ft.), finding a Junco's nest on the summit, containing three fresh eggs. Two Loons were also observed on the lake below, which is now known as Lyster Lake. On the 19th, a female Hummingbird was seen, the first record since May 28th! They appear to have been very scarce this year. On the 29th, four White-winged Crossbills were seen in the large swamp near Beebe.

August.—On the 1st, I was fortunate in observing an immature male of the Mourning Warbler, in some thick blackberry bushes at the side of the road, not very far from the spot where I obtained the Orange-crowned Warbler in September, 1919. On the 11th,

I obtained my first personal record of the Red Crossbill, and Purple Martin, both of which were seen near Massawippi Station, two of the former, and one of the latter. The former used to be plentiful here at one time, but of late years has been supplanted by the White-winged species, which has been especially numerous and well distributed this season, in many parts of the Province, as well as the Red Crossbill. It was a great pleasure to meet with the Purple Martin, although only one example was seen, perched on the telephone wires, with a number of Barn, Cliff, Tree, and Bank Swallows. On this date also, I met Mrs. Piercy of Ayer's Cliff, who told me she had seen the Wood Duck transporting her young in her bill from the nest to the water. The site was a hole in an old tree, on the banks of the River Tomifoby, above Ayer's Cliff. On the 17th, Mr. Napier Smith obtained his first record for the Red Crossbill at Magog.

September.—On the 14th, a Wilson's Warbler was seen, and on the 19th, whilst hunting for rock ferns in the big gorge at Coaticook, I came upon an immense Crow roost, the ground all under the trees being covered with feathers and droppings. This is probably the roost, or one of the roosts, I always supposed lay to the east or northeast of Hatley, see 'Auk,' Vol. XXXIII, 1916, p. 73. On the 21st, I saw a female Scarlet Tanager, quite an unusual sight, for of the very few birds seen each season, it is generally the male that has been in evidence. On this same day, which by the way happened to be a very cold one, the thermometer only registering 32° at 7 A. M., a small flock of seven Canada Geese passed over Hatley, and in so doing, created a record for the past twelve years, as my earliest previous date is October 7, 1918. On the 26th, a few Pine Siskins were noted (previous earliest date, Oct. 11) and a Tennessee Warbler on the 27th. As regards the Warblers, the present fall has been a most disappointing one, very few birds having been seen, and this remark might apply equally well to most species of other birds besides. One notable example that occurs to me at the moment is that of the Solitary Sandpiper, a very common bird here in the fall, but which I have not seen since August 26, a very different state of affairs to last September, as already recorded.

October.—This month was ushered in by an abnormal heat

wave, the temperature on the 1st reaching 80° in the afternoon. On the 3rd, another flock of eleven Canada Geese was seen going south, notwithstanding the continued heat wave. On the 9th, large numbers of Ducks of various kinds were reported on Lake Massawippi, in fact, it is many years since Duck shooters had such a time as during the present month. On the 14th, a Fox Sparrow was noted, and four Prairie Horned Larks. The former are uncommon here, and I seldom see very many of them in a season. In 'The Canadian Naturalist,' 1840, p. 245, Gosse speaks of having seen three or four of them at the edge of a maple wood, about the middle or end of July. One would feel inclined to suppose that Gosse was in error in this matter, if it was not for the fact that he was well acquainted with the bird in Newfoundland, where he had spent seven or eight years before coming to Compton. My earliest date for the arrival of the bird in the fall is October 6. On the 16th, a Yellow Palm Warbler was observed, and four days later, the last of the Myrtle Warblers were seen. At the end of the month, a large flock of Snow Buntings was seen by Mr. Greer.

November.—On the 3rd, Goldfinches, Redpolls, and Pine Siskins were seen, the latter being especially numerous. A week later, on the 10th, a Brown Creeper and five Red Crossbills were noted, and on the 14th, a Meadowlark, with three White-winged Crossbills on the 18th. On the 26th, a Great Grey Owl was obtained, near North Hatley, by Mr. Willis Bassett, and sent to Mr. Greer to be mounted. This is the second record only that I know of for this species, the previous one having been mounted by Mr. Greer, as already recorded. On the 17th, two Robins were seen near North Hatley, and a Prairie Horned Lark near Katevale on the 26th, both records being sent me by Mr. Greer. The latter for the Prairie Horned Lark is three weeks later than any previous date so far obtained for this species.

December.—Pine Siskins are about in great flocks, and on the 2nd, twelve White-winged Crossbills were seen, these birds being very numerous, as well as the Red Crossbills. Pileated Woodpeckers also seem to be more in evidence than usual, and Crows are wintering in many localities, little flocks of from six to ten having been several times recorded. On the 23rd, the first Northern Shrike was seen, and I also took 'Bird-Lore's' yearly Christmas

Census, recording 15 species, with a total of 424 individuals seen, of which number 100 were White-winged Crossbills. On the 27th, the first Goshawk for the winter was recorded, and two Golden-crowned Kinglets were also seen, this being a record by two days, my latest previous date being December 25, 1915. On the 28th, it snowed heavily all day, with a temperature of 4° below zero, which gradually increased to 20° below on the 30th, making it appear as though the year 1922 was going out like a lion. This, however, was not to be the case, as a rapid thaw set in on the 31st, and on New Year's Day, 1923, it was raining, with a temperature of 38°. This, I think, about sums up the principal events for the past two years, so I will now proceed with the annotated list of the twelve new species added since 1919, carrying on the numbering from where it previously left off.

176. *Oporornis philadelphia* (Wils.). MOURNING WARBLER.—Rare transient. Already recorded, see 'Auk,' Vol. XXXVIII, 1921, p. 126. Since the above record of a young male taken by Mr. L. M. Terrill on Mt. Orford in 1920, I have been fortunate in seeing one at Hatley on August 1, 1922, as previously mentioned in the present paper.

177. *Colymbus auritus* Linn. HORNED GREBE.—Uncommon transient. Already recorded, see 'Auk,' Vol. XXXVIII, 1921, p. 126.

178. *Oidemia deglandi* Bonap. WHITE-WINGED SCOTER.—Occasional transient. Whilst on Lake Massawippi on May 28, 1921, I saw what at first sight I took to be a Black Duck, but on a nearer approach the white speculum in the wing became clearly visible, and its mode of flight, low over the water when flushed on several occasions, proclaimed it to be a White-winged Scoter. On October 9 of the present year 1922, Mr. Percy Bowen, of Hatley, obtained a male on the above lake, which was shown to me in the flesh the same evening. It weighed 3 lbs. 2 oz.

179. *Bombycilla garrula* (Linn.). BOHEMIAN WAXWING.—Rare winter visitant. I am indebted to my friend, Mr. Napier Smith of Magog, for this record. He wrote me on December 14, 1921, that on the 6th inst. sixteen of these handsome birds were in a small tree in front of his house when he returned home in the middle of the day. The birds were reported from several other localities in the Province, there being quite an abnormal influx of the species.

180. *Archibuteo lagopus sancti-johannis* (Gmel.). ROUGH-LEGGED HAWK.—An uncommon fall and winter visitant. I am again indebted to Mr. Smith for this record, as in the above letter, he also mentions the fact of having watched a bird of this species being buffeted about by a southwest gale on December 1, 1921, as it tried to keep its bearings south.

181. *Phalacrocorax auritus auritus* (Swains.). DOUBLE-CRESTED CORMORANT.—Casual transient. On my return from England in March,

1922, I heard of one of these birds having been shot on Lake Massawippi in November, 1921, somewhere between the 10th and 15th, the exact date not being remembered. The bird is now in the possession of Mr. Fred Mitchell of Sherbrooke, where I saw it on October 10, of the present year 1922.

182. *Sturnus vulgaris* Linn. STARLING.—Rare visitant. I am again indebted to Mr. Smith for this record, he having obtained an example of the bird at Magog on March 13, 1922. It was first seen at 1:15 P. M. on March 11, feeding in the middle of Main Street with some English Sparrows, which with their customary cheek and curiosity, were keeping a close watch over the new-comer. Two days later, it was again in the same spot, with the same bodyguard, and was later on secured, and on dissection proved to be a male. Probably this bird came up the Connecticut River Valley, and is the first record for Quebec. What this beginning may lead to, no one can tell. I remember staying with my friend, Dr. Chas. W. Townsend, at Ipswich, Mass., in May, 1916, when we were called to a neighboring house, to see a nest containing some curious unknown fledglings. These proved to be young Starlings, and the first breeding record for the district. Visiting the doctor again in 1921, I saw flocks containing hundreds of birds! Starlings were first introduced into this country by Eugene Schieffelin, sixty birds being liberated in Central Park, New York, in 1890, and forty more in 1891. From these one hundred birds descended the millions that now invade the country for more than one hundred miles north of New York City, and ere long will no doubt become more or less of a plague here.

183. *Dendroica palmarum palmarum* (Gmel.). PALM WARBLER.—Very rare transient. So far as I am aware, this is the only record for the Province of Quebec. The bird first attracted my attention on May 12 of the present year 1922. It was flitting about in a small wood adjoining the little marsh near my house, and from the first, I felt sure it was *palmarum* and not *hypochrysea* or the Yellow Palm Warbler, as the underparts were very dull in comparison to the bright yellow of an example of *hypochrysea* I had seen in this same wood, only a few days before. However, it was late in the afternoon, and having no gun, I had to content myself with the hope that it would be there the following day. In this I was not disappointed, and after a search of some two hours, I again found the bird in a cedar tree, and secured it, and later on sent it in the flesh and presented it to the Victoria Memorial Museum at Ottawa. I find on reference to Ora Knight's 'Birds of Maine,' 1908, that there is no record of the species ever having been taken in Maine. Miss Inez Addie Howe of the Fairbanks Museum of Natural Sciences at St. Johnsbury, Vermont, writes me on June 10, 1922, that there are no records in the Museum for Vermont, their type specimens having been taken in Massachusetts. In Allen's 'Birds of New Hampshire,' there are no spring records given, but an example was secured at Shelburne in the Androscoggin Valley on September 16, 1884, as recorded by Dr. A.

P. Chadbourne, and Mr. Allen speaks of having taken specimens in the Saco Valley at Intervale, between the 8th and 14th of September. Its reported presence at Manchester in spring, he goes on to say, is probably an error ('Proc. Manchester Inst. Arts & Sci.,' Vol. II, p. 82, 1901).

In 'Birds of the Jefferson Region, New Hampshire,' the late Mr. Horace W. Wright speaks of the bird as a rare fall migrant. The range of the appearance of the species, he gives as from September 10 to October 4, and within that period of twenty-four days, one, two, or three individuals respectively, had been seen in each of the years 1904-1910 except 1905.

In 'Life and Sport on the North Shore' (of the St. Lawrence) by Napoleon A. Comeau, 1909, there is a reference on page 433, leading one to suppose that the Palm Warbler had been met with on some few occasions at Godbout. This is evidently an error. The birds referred to without doubt being the Yellow Palm Warbler (*D. Palmarum hypochrysea*); at all events, they are treated as such by Mr. Ridgway in his 'Birds of North and Middle America,' Vol. 2, 1902.

184. *Marila marila* (Linn.). SCAUP DUCK.—Occasional transient. A male example of this species was shot by Mr. Percy Bowen on Lake Massawippi, on October 9, 1922, and was seen by me in the flesh the same day. It weighed 2 lbs.

185. *Oidemia perspicillata* (Linn.). SURF SCOTER.—Occasional transient. A female of this species was also shot by Mr. Percy Bowen on Lake Massawippi on the above date, and was seen by me in the flesh the same day. It weighed 2½ lbs.

186. *Charitonetta albeola* (Linn.). BUFFLEHEAD.—Occasional transient. A female of this species was secured on Lake Massawippi by Mr. Piercy in the fall of 1921, and I saw the bird when mounted. At that time, it was in the possession of Mr. Fred Mitchell of Sherbrooke.

187. *Anas platyrhynchos* Linn. MALLARD.—An uncommon transient. A few of these birds have been obtained on Lake Massawippi from time to time, by Mr. Piercy of Ayer's Cliff, so he tells me, but none of the birds were preserved.

During the year 1923, I have done very little bird work, beyond keeping records of the arrival and departure of the migrants, most of my time being devoted to the orchids. However, there are certain outstanding events which seem to call for some special notice. First and foremost amongst these, is not only the arrival of the Starling (*Sturnus vulgaris*) at Hatley, but also its breeding here, which event so far as I am aware, is the first recorded one for the Dominion of Canada, see 'The Auk,' Vol. XL, 1923, Nos. 3 and 4, pp. 539 and 694. Two broods were reared in the top of the spire of St. James' Church, and at the time of writing (November 30), the two old birds still roost there every night.

Other interesting birds, that bred in the village for the first time, were a pair of Belted Kingfishers (*Ceryle alcyon*), and a pair of Bank Swallows (*Riparia riparia*), both species selecting the face of the village gravel pit, for the site of their nesting holes. Pileated Woodpeckers have also frequently been seen in the village, all through the year, more especially on the trees surrounding the common. White-winged Crossbills (*Loxia leucoptera*) were seen in January, and on March 11 a Richardson's Owl (*Cryptoglaux funerea richardsoni*) was picked up dead in some woods near Stanstead and sent to me in the flesh, this being about the best record for the winter. Early in June, systematic hunts were made on the shores of lake Massawippi for nests of the Northern Water Thrush (*Seiurus noveboracensis noveboracensis*), but without success, although on the 12th a female was seen carrying nesting material, but could not be followed, owing to the difficult and swampy nature of the ground. On the 16th, a nest of the Black-throated Blue Warbler (*Dendroica caerulescens caerulescens*) was found, containing four young birds just hatched out. The nest was resting on the branch of an American Yew, one foot above the ground, and as if to prove how difficult it is to find Warbler nests, unless you are specially looking for them, this was the only one met with during the whole season. Migrant Shrikes (*Lanius ludovicianus migrans*) were very scarce, only two birds being seen all through the season, and these were not found on the old nesting grounds, the trees on one of them having been all cut down. One of the most gratifying events of the past two or three years is the gradual return of the House Wren (*Troglodytes aëdon aëdon*) to these parts. Formerly, as already recorded, I only knew of one pair of birds; now, I have records of them nesting in boxes at Lennoxville, Magog, and Ayer's Cliff. At the last named place, Dr. C. L. Brown tells me that no less than three pairs occupied boxes in his garden this summer. At Hatley the pair already recorded in 1918, 'Auk,' Vol. XXXVI, p. 479, are still nesting in the old locality, at the edge of some woods, a quarter of a mile or so from any house.

Another bird belonging to the Transition zone, the Indigo Bunting (*Passerina cyanea*), seems to be coming more frequently into the district, for I saw two different broods the first week in

August, the parents of which were feeding the young, they apparently not long having left the nest.

My little marsh was practically dried up for the best part of the year, owing to a bad leakage near the dam, and what with this, and the fact of my having resided in the village for the past twelve months, I have seen very few marsh birds. It seems sad that the whole aspect of this little marsh is changing, and I feel I am gradually losing interest in it. One thing I have to be thankful for, however, is that I got all my Sandpiper records before it was too late.

May was cold and backward, most of the early wild flowers being a fortnight behind time. It was snowing here on the 10th, and very cold. The first Myrtle Warbler (*Dendroica coronata*) was seen on the 7th, then there was a little wave on the 11th, Black and White (*Mniotilta varia*), Black-throated Green (*Dendroica virens*), and Myrtle Warblers (*D. coronata*) being in evidence, but it was not until the 19th to the 22nd that any appreciable flight took place, and then the Warblers that did come were not in their usual numbers, in fact, I hardly ever remember seeing fewer. I have no spring records for Orange-crowned (*Vermivora celata celata*), Tennessee (*V. peregrina*), Cape May (*Dendroica tigrina*), Bay-breasted (*D. castanea*), Black-poll (*D. striata*), Yellow Palm (*D. palmarum hypochrysea*), Pine (*D. vigorsi*), Mourning (*Oporornis philadelphia*), or Wilson's (*Wilsonia pusilla pusilla*) Warblers, and out of this number I saw only the Tennessee, Black-poll, and Yellow Palm in the fall. Possibly, the most noteworthy thing about the fall migration was the unusual number of Yellow Palm Warblers, a species I do not very often meet with, except in very limited numbers. The last Myrtles were seen on October 18, which is six days short of a record. As in the spring, so likewise in the fall, nothing like the usual number of Warblers were seen, and I cannot say I remember any particular day on which a large flight took place, the birds apparently passing through gradually. What with the above poor results, and the loss of my Sandpipers, I feel as if there had been no season at all.

On September 18, I saw a Labrador Chickadee (*Penthestes hudsonicus nigricans*), and the day previous was told that Dr. Brown's son had shot a Mallard (*Anas platyrhynchos*) on Lovering Pond

near Ayer's Cliff. On October 26, a flock of twenty-six Canada Geese (*Branta canadensis canadensis*) were seen by my elder son, and this is the only record I have for this winter. The day following, fifteen Starlings (*Sturnus vulgaris*) were flying round the ball on the top of the church spire, in addition to three already perched on it. The former, finding no room, flew off South, and were not seen again, see 'The Auk,' Vol. XLI, 1924, No. 1, pp. 158-59, for this and further records of the occurrence of the Starling in Canada.

On November 3, and again on the 14th, Pine Grosbeaks (*Pinicola enucleator leucura*) were seen in the village, and the day following the last flock of Crows (*Corvus brachyrhynchos brachyrhynchos*). Last year these birds wintered in numbers for the first time in my experience, and it seems strange that with such an open season as the present one, that they should not have done so again this year. The last Juncos (*Junco hyemalis hyemalis*) and Tree Sparrows (*Spizella monticola monticola*) were seen on the 15th, from which date to the end of the month nothing of interest was noted. On December 8, whilst at Ayer's Cliff, I was surprised to see two Blackbirds in a large flock of English Sparrows (*Passer domesticus domesticus*), which were feeding on some grain in the station yard. On a near approach, they turned out to be two male Cowbirds (*Molothrus ater ater*), a most unexpected record for so late in the year, especially as the species is uncommon here at all times, although slightly on the increase of late years. On the 10th I saw the pair of Starlings go to roost as usual in the ball on the top of the church spire at 3:25 P. M., but this was to be my last view of them, as they must have either gone South the following day, or else changed their roosting quarters, for I have not seen them since. I think the first is the more likely solution. On the 13th, nine Pine Grosbeaks were seen in a field feeding on the seeds of Charlock (*Brassica arvensis*), a weed which often abounds in grain fields. On the 27th, I took 'Bird-Lores' Christmas Census, recording eleven species of birds, with a total of 105 individuals. Amongst these were two Golden-eyes (*Clangula clangula americana*), four Golden-crowned Kinglets (*Regulus satrapa satrapa*), and a Crow, an example of the latter not having been seen since November 4, as already recorded. Only twice previously, in 1915 and 1922, have I seen Golden-crowned Kinglets in December.

No Crossbills, Northern Shrikes, Goshawks or Snow Buntings have been seen this winter, the only northern visitors recorded being Pine Grosbeaks and Red Polls (*Acanthis linaria linaria*).

Whilst at Ayer's Cliff on December 27, I heard that several Pheasants had been taken in this district of late. The birds no doubt have come in from the State of Vermont, probably from near Willoughby Lake (about twenty miles or so to the south of Hatley), where I understand many birds have been liberated from the game farms there. The first record appears to be of a bird seen on Stanstead Plain during the months of September and October, 1921, which was eventually shot by a Mr. Durocher, who I believe still has it as a mounted example. The birds doubtless are not the true English Pheasant (*Phasianus colchicus*), but belong to the strain *P. colchicus* \times *P. torquatus*, in which a white neck ring is always more or less developed, hence the name Ring-necked Pheasants (*Phasianus torquatus*) by which the birds are known.

With the addition of the above species to my list, the total now stands at 188 species and subspecies for Hatley and district. As in 1922, the weather remained open and mild until nearly Christmas, when a cold wave set in accompanied with snow, and a temperature a little below zero.

Certainly, this year might be described as the "Summer and Winter of my discontent," for taking it on the whole I never remember having seen fewer birds, and I think this has been the experience of many, especially during the fall and winter months.

Hatley, Quebec.

NINTH ANNUAL LIST OF PROPOSED CHANGES IN THE
A. O. U. 'CHECK-LIST' OF NORTH AMERICAN BIRDS.

BY HARRY C. OBERHOLSER.

THIS is the Ninth Annual List of proposed A. O. U. 'Check-List' additions and changes in the names of North American birds. Like the eight already published,¹ the present list comprises only ornithological cases—*i. e.*, such as require specimens or the identification of descriptions for their determination—and consists of additions, eliminations, rejections, and changes of names due to various causes. However, only changes known to be the result of revisionary work are included; therefore no mention is here made of changes involved in names in local lists or elsewhere, used without sufficient explanation or not known to be based on original research, of changes or additions queried or but tentatively made, or of the elimination of subspecies by authors who, on general principles, recognize no subspecies.

Since the compiler of these annual lists has been sometimes credited with opinions therein expressed, it may be well to emphasize anew the fact that these lists are intended to reflect only the opinions of the original proposers of additions or changes, and that in no case is there to be construed any comment by the compiler or action by the A. O. U. Committee.

This list is intended to include everything pertinent up to December 31, 1923, and nothing after that date has been taken. In view of the volume and widely scattered character of current ornithological literature, it is not at all unlikely that some names or changes have been overlooked, and the writer would be very thankful for reference to any omissions, in order that such may be duly given a place in next year's list.

¹ For these previous lists, see 'The Auk,' XXXIII, October, 1916, pp. 425-431; XXXIV, April, 1917, pp. 198-205; XXXV, April, 1918, pp. 200-217; XXXVI, April, 1919, pp. 266-273; XXXVII, April, 1920, pp. 274-285; XXXVIII, April, 1921, pp. 264-269; XXXIX, April, 1922, pp. 243-249; XL, October, 1923, pp. 677-682.

ADDITIONS AND CHANGES IN NAMES.¹

Uria troille (Linnaeus) becomes **Uria aalge** (Pontoppidan) (*Colymbus aalge* Pontoppidan, Danske Atlas, I, 1763, p. 621, pl. XXVI [Iceland]), since the former name proves to be based on *Uria lomvia* and is therefore unavailable for the common Guillemot. (Cf. Mathews and Iredale, Austral Avian Record, V, 1923, pp. 49-50; Jourdain, British Birds, XVI, 1923, p. 322; Ibis, 1923, pp. 436-438.) The North American forms of the Murre will therefore stand as follows:

Uria aalge aalge (Pontoppidan).

Uria aalge californica (Bryant).

Larus argentatus Pontoppidan becomes **Larus varius** Pontoppidan (Danske Atlas, I, chap. 10, 1763, after March, p. 622 (Denmark), because the latter name is of identical application and has anteriority. (Cf. Mathews and Iredale, Austral Avian Record, V, No. 2-3, February 21, 1923, p. 51.)

Sterna paradisaea Brünnich becomes **Sterna macrura** Naumann, Isis (von Oken), III, Heft. 12, December, 1819, col. 1847 (coast of Schleswig-Holstein), because *Sterna paradisaea* Brünnich is pre-occupied by *Sterna paradisaea* Pontoppidan (Danske Atlas, I, chap. 10, 1763, after March, p. 622), which is unidentifiable; and the next available name is *Sterna macrura* Naumann. (Cf. Mathews and Iredale, Austral Avian Record, V, No. 2-3, February 21, 1923, p. 52.)

Calonectris kuhlii kuhlii (Boie) becomes **Calonectris diomedea diomedea** (Scopoli) (*Procellaria diomedea* Scopoli, Annus I, Historico Naturalis, 1769, p. 74), because the latter name applies to the same species and has priority. (Cf. Mathews and Iredale, Austral Avian Record, V, No. 2-3, February 21, 1923, pp. 57-58.)

Anas novimexicana Huber becomes **Anas diazi novimexicana** Huber, because considered to be a subspecies of *Anas diazi* Ridgway. (Cf. Conover, 'The Auk,' XXXIX, No. 3, July, 1922, p. 412.)

Branta canadensis minima Ridgway becomes **Branta minima** Ridgway, because regarded as specifically distinct from *Branta canadensis canadensis*. (Cf. Figgins, Proc. Colorado Mus. Nat. Hist., IV, No. III, 1923, pp. 2-19.)

† **Mesophoyx intermedia** (Wagler). *Ardea intermedia* Wagler (Hasselt MS.), Isis (von Oken), XXII, Heft. 6, June, 1829, col. 659 ("Java").

¹ Additions to the A. O. U. Check-List, the Sixteenth, Seventeenth, and Eighteenth Supplements, and the First to Eighth Annual Lists are marked with a dagger (†). Generic (and subgeneric) names so indicated do not now stand in these lists in either generic or subgeneric sense.

Recorded as North American from a specimen taken in British Columbia. (Cf. Kermode, Canadian Field-Naturalist, XXXVII, No. 4, April 21, 1923, pp. 64-65.)

† ***Rallus yumanensis*** Dickey. New species. Dickey, 'The Auk,' XL, No. 1, January, 1923, p. 90 ("Bard, Imperial County, California"). Range: Lower Colorado River Valley.

Creciscus jamaicensis jamaicensis (Gmelin) becomes ***Creciscus jamaicensis stoddardi*** Coale ('The Auk,' XL, No. 1, January, 1923, p. 89; "Hyde Lake, Illinois"), by subspecific separation of the North American bird from that of Jamaica. (Cf. Coale, 'The Auk,' XL, No. 1, January, 1923, pp. 88-90.)

Limnocryptes gallinula (Linnaeus) becomes ***Limnocryptes minimus*** (Brünnich) (*Scolopax minima* Brünnich, Ornith. Borealis, 1764, after February 20, p. 49, Christiansoe Island, Denmark), since the latter name has priority and is of identical application. (Cf. Hartert, Practical Handb. Brit. Birds, part XVI, (vol. II), March 7, 1923, p. 679.)

† ***Perdix perdix perdix*** (Linnaeus). *Tetrao perdix* Linnaeus, Syst. Nat., ed. 10, I, January 1, 1758, p. 160 ("Europae agris:" type locality, Sweden). Successfully introduced and acclimatized in Saskatchewan, Canada. (Cf. Bradshaw, Canadian Field-Naturalist, XXXVI, No. 5, May 22, 1922, pp. 91-92); and in the State of Washington (Oldys, Yearbook U. S. Dept. Agric., for 1909 (1910), p. 257; Holland, Bull. Amer. Game Protective Association, XI, No. 4, October, 1922, p. 4.)

Oreortyx picta picta (Douglas) becomes ***Oreortyx picta palmeri*** Oberholser, nom. nov. ('The Auk,' XL, No. 1, January, 1923, p. 84, "Yaquina, Oregon"), because the name *Oreortyx picta picta* applies to the Plumed Quail, *Oreortyx picta plumifera*. (Cf. Oberholser, 'The Auk,' XL, No. 1, January, 1923, pp. 80-84.)

Oreortyx picta plumifera (Gould) becomes ***Oreortyx picta picta*** (Douglas), since the latter name is based on the same race as is *Oreortyx picta plumifera*, and is of earlier date. (Cf. Oberholser, 'The Auk,' XL, No. 1, January, 1923, pp. 80-84.)

† ***Lophortyx californica achrustera*** Peters. New subspecies. Peters, Proc. New England Zool. Club, VIII, May 16, 1923, p. 79 (La Paz, Lower California). Range: Southern Lower California.

† ***Dendragapus obscurus howardi*** Dickey and van Rossem. New subspecies. Dickey and van Rossem, Condor, XXV, No. 5, October 3, 1923, p. 168 (Mount Pinos, Kern County, California). Range: Southern Sierra Nevada, California.

† **Dendragapus obscurus munroi** Griscom. New subspecies. Griscom, American Museum Novitates, No. 71, April 30, 1923, p. 1 (Queen Charlotte Islands, British Columbia). Range: Queen Charlotte Islands, British Columbia.

† **Zenaidura macroura peninsulari** Bailey. New subspecies. H. H. Bailey, Wilson Bulletin, XXXV, No. 2, June, 1923, p. 100 (Miami Beach, Florida). Range: Peninsula of Florida.

Cymindes sociabilis (Vieillot) becomes **Cymindes sociabilis plumbeus** (Ridgway) (*Rostrhamus sociabilis* var. *plumbeus* Ridgway, in Baird, Brewer, and Ridgway, Hist. North Amer. Birds, Land Birds, III, 1874, p. 209; Everglades, Florida), because the bird from Florida and Central America proves to be subspecifically separable from *Cymindes sociabilis sociabilis* of South America. (Cf. Swann, Synopsis Accipitres, III, February 16, 1922, p. 156.)

Hierofalco rusticolus alascanus (Swann) becomes **Hierofalco rusticolus sacer** (J. R. Forster) (*Falco sacer* Forster, Philos. Trans. Lond., LXII, 1772, pp. 383, 423 ("Severn River, Hudson's Bay," Ontario, Canada), because the latter name is of far earlier date and apparently identical application. (Cf. Preble, North American Fauna, No. 46, June 20, 1923, p. 83.)

Dryobates pubescens homorus Cabanis becomes **Dryobates pubescens leucurus** (Hartlaub) (*Picus leucurus* Hartlaub, Naumannia, II, No. 2, 1852, p. 55), because the latter name is of earlier date and identical application. (Cf. Grinnell, Condor, XXV, No. 1, January 17, 1923, pp. 30-31.)

Calypte Gould becomes **Zephyritis** Mulsant and Verreaux (Mém. Soc. Impér. Sci. Nat. Cherbourg, XII, 1866, p. 231) by the separation of the North American species as generically distinct from the genus *Calypte*. (Cf. Simon, Hist. Nat. Trochilidae, 1921, p. 401.) The two North American species are:

Zephyritis costae (Bourcier).

Zephyritis anna (Lesson).

† **Spinus pinus macropterus** (Bonaparte). *C[hrysomitris] macroptera* Bonaparte (Du Bus, MS.) Consp. Avium, I, January, 1851, p. 515 (Guatemala; Mexico). Recorded as North American from specimens taken in Lower California. (Cf. Todd, 'The Auk,' XL, No. 2, April, 1923, p. 330.)

† **Aimophila obscura** Dickey and van Rossem. New species. Dickey and van Rossem, Condor, XXV, No. 4, July 28, 1923, p. 128 (Prisoner's Harbor, Santa Cruz Island, California). Range: Santa Cruz and Santa Catalina Islands, California.

REJECTIONS AND ELIMINATIONS.¹

***Sterna paradisaea* Brünnich vs. *Sterna macrura* Naumann.** Proposed change (cf. Mathews and Iredale, Austral Avian Record, V, 1923, p. 52) rejected, because *Sterna paradisaea* Pontoppidan (Danske Atlas, I, 1763, p. 622), which antedates *Sterna paradisaea* Brünnich, is identifiable from Brünnich's later description. (Cf. Hartert, Vögel paläarkt. Fauna, Nachtrag, I, 1923, p. 85.)

* ***Pterodroma* Bonaparte = *Bulweria* Bonaparte;** because anatomical differences are not considered valid generic characters! (Cf. Loomis, 'The Auk,' XL, No. 4, October, 1923, pp. 601-602.)

* ***Anas fulvigula maculosa* Sennett.** Considered inseparable from *Anas fulvigula fulvigula* Ridgway. (Cf. Phillips, Nat. Hist. Ducks, II, 1923, p. 61.)

* ***Branta canadensis hutchinsii* (Richardson).** Eliminated as a hybrid. (Cf. Figgins, Proc. Colorado Mus. Nat. Hist., IV, No. III, 1923, pp. 2-19.)

* ***Branta canadensis occidentalis* (Baird).** Eliminated as a hybrid. (Cf. Figgins, Proc. Colorado Mus. Nat. Hist., IV, No. III, 1923, pp. 2-19.)

***Creciscus jamaicensis stoddardi* Coale = *Creciscus jamaicensis jamaicensis* (Gmelin).** (Cf. Wayne, 'The Auk,' XL, No. 2, April, 1923, p. 319.)

* ***Dendragapus obscurus munroi* Griscom.** Regarded as identical with *Dendragapus obscurus silkensis* Swarth. (Cf. Grinnell, Condor, XXV, No. 51, October 3, 1923, pp. 185-186.)

* ***Coccyzus americanus occidentalis* Ridgway.** Eliminated because considered not satisfactorily distinguishable from *Coccyzus americanus americanus*. (Cf. Todd, Annals Carnegie Museum, XIV, October, 1922, p. 213.)

* ***Corvus brachyrhynchos pascuus* Coues.** Eliminated as not distinguishable from *Corvus brachyrhynchos brachyrhynchos* Brehm. (Cf. Bailey, Wilson Bulletin, XXXV, No. 3, September, 1923, pp. 148-149.)

* ***Melospiza melodia phaea* Fisher.** Eliminated, because considered not separable from *Melospiza melodia morphna*. (Cf. Swarth, Condor, XXV, No. 6, December 20, 1923, p. 218.)

¹ Eliminations from the A. O. U. Check-List, the Sixteenth, Seventeenth, and Eighteenth Supplements and the First to Ninth Annual Lists, are designated by an asterisk (*).

- * *Melospiza melodia inexpectata* Riley. Eliminated, because considered not separable from *Melospiza melodia morphna*. (Cf. Swarth, Condor, XXV, No. 6, December 20, 1923, p. 218.)

DESCRIPTION OF A NEW FLYCATCHER FROM ARGENTINA.

BY ALEXANDER WETMORE.

CONTINUED work on collections made in Argentina during 1920 and 1921 has shown a species of Tyrannidae not previously recognized by science. It may be known as

Suiriri improvisa, sp. nov.

Characters.—Similar to *Suiriri affinis* (Burmeister)¹ but smaller; feet decidedly smaller; a distinct grayish band across chest; much darker above, and on sides of head; rectrices without yellowish at base.

Description.—Type, U. S. National Museum Cat. no. 284,899, female, taken at Tapia, Province of Tucumán, Argentina, April 9, 1921, by Alexander Wetmore (original number, 6435). Crown, hind neck, and sides of neck deep mouse gray, with a very faint wash of olive; back, scapulars, and upper tail-coverts deep grayish olive, rump faintly brighter; wings and tail dull black; lesser wing coverts tipped with deep grayish olive; median wing coverts tipped heavily, greater coverts more narrowly with olive-buff, forming two pronounced wing-bars; secondaries margined widely, primaries edged narrowly with pale olive-buff; primary coverts tipped slightly with same; outer web of outer rectrix pale olive-buff except at tip, other rectrices edged narrowly with deep grayish olive basally, lightening to olive-buff near tips; rectrices without distinct paler color at base; a faint whitish line at base of bill; lores blackish; a few white feathers on upper and lower eyelids; space below eye and auricular region deep mouse gray, with very narrow shaft streaks of white; chin and throat white, shading to light mouse gray on center of breast, this becoming mouse gray laterally; lower breast, abdomen and under tail-coverts primrose yellow; sides and flanks dull vetiver green; axillars, under wing coverts and edge of wing naphthalene yellow; outer under wing coverts clouded with grayish. Bill, feet, and tarsus black (in dried skin).

Measurements.—(In millimeters, of type): Wing, 68.5; tail, 61.7; culmen from base, 13.0; tarsus, 18.7.

Range.—Known only from Tapia, Tucumán.

¹ *Elaeena affinis* Burmeister, Syst. Uebers. Thiere Brasiliens, 1856, p. 477. (Lagoa Santa, Brazil.)

Remarks.—The present species appears congeneric with *Suiriri suiriri* but has a decidedly larger bill. It combines the general appearance of *S. suiriri* with the coloration of *Sublegatus fasciatus* (Thunberg). It is also suggestive of *Suiriri affinis* from which it differs as outlined in the diagnosis. It is astonishing to find so distinct a species at such a well known locality as Tapia and for some time I have searched in literature for a name for it without success. Some doubt has attached to the identity of *Sublegatus frontalis* Salvadori,¹ but Dr. Hellmayr informs me that it is a synonym of *S. fasciatus*, and states further that he has not previously seen a bird like the type of *improvisa*.

Biological Survey, Washington, D. C.

GENERAL NOTES.

Apparent Nesting of the Hooded Merganser in Lancaster Co., Pa.

—On May 18, 1924, my dog surprised a male Hooded Merganser under an overhanging bank of Hammer Creek some six miles from Lititz, Pa. The bird splashed to mid-stream, floated there for a second and then seeing me twelve yards away, he flushed and whipped out of sight around the projecting bushes. Clifford Marburger and I while making our Christmas bird census last December had caught a glimpse of a distant duck which we thought was a Hooded Merganser and as the winter had been exceptionally open the thought arose that possibly this bird had remained to breed.

On the morning of May 25, I was again on the Hammer Creek meadow, with my dog "Barley." The location is in northern Lancaster County fifteen miles from the Susquehanna River, and throughout its quarter mile course in this meadow the stream presses against an embankment well covered with an old growth of sycamores, white elms, white oaks and red maples, the other side being fairly open pasture land, very boggy in places with scattered clumps of alder, wild rose and swamp willow.

We beat cautiously up stream and a hundred yards above the overhanging bank there was a flutter and splash and "Barley" had run into the female Merganser. He watched her unusual actions with apparent amazement. There she was on the water not twenty-five yards away, her little brown crest fairly bristling with excitement. Something had given this shy bird courage. Even as I came up with the dog she swam boldly back toward him. Fifteen yards from us she wheeled and splashed heavily away along the water uttering as she went a guttural cackle. Coming

¹ Boll. Mus. Zool. Anat. Comp. Torino, vol. 12, May 12, 1897, p. 14. (Caiza, Chaco Boliviano.)

quickly to float again she returned once more to approach us, almost as close as the first time, and once more to wheel and drag herself pitifully and noisily away. Now she edged reluctantly toward her mate who during the entire performance had been swimming nervously about in full view fifteen to twenty yards beyond her. The danger which made the female frantic and foolhardy had inspired the drake too, but never beyond the point of caution. Together the pair swam around a point of land, conveniently near and a few minutes later when I followed them—as they doubtless planned that I should—both birds were gone and though we hunted the ground thoroughly, as we thought, and, concealed in an alder clump, waited and watched for an hour, the rest of the day's record was a blank.

In reading E. A. Samuel's account of ways of the mother Merganser in Bent's 'Life Histories' the full humor of the situation dawned upon me and I realized that I and my dog, whose praises I am always ready to sing, had been out-witted by an old trick cleverly executed. For the purpose of a breeding record however, my evidence was just as convincing to me as if I had seen the downy balls swimming with their mother instead of being concealed under the stream bank as they undoubtedly were. Presumably the pair had nested in one of the large sycamores, showing many likely holes, which overhung the creek at the point where I first saw the female.

I visited the spot four times during the following three weeks and saw the male on May 29, while an interested farmer told me of seeing a pair of flying Ducks on June 13, and of observing a pair of "wild ducks" about the place in the summer of 1923.—HERBERT H. BECK, *Franklin and Marshall College, Lancaster, Pa.*

King Eider on Long Island in June.—The King Eider (*Somateria spectabilis*) is a regular winter visitor to the eastern end of Long Island,—usually rare, but occasionally fairly common,—the extreme migration dates being Nov. 1 to April 27. There are, however, only two definite records for it in the western and central parts of the island,—namely, Amityville, November 13, (Dutcher's Long Island Notes) and Mastic, early October, 1912, (specimen taken by W. S. Dana).

It was therefore with great interest that Mr. Ord Myers and the writer observed an immature male of this species at Long Beach, Nassau County, on June 1, 1924. The bird was swimming with a flock of about twenty White-winged and Surf Scoters (*Oidemia deglandi* and *O. perspicillata*) a short distance off-shore and was under observation through 8X and 16X glasses twice, for periods of about fifteen minutes each. We noted the size, which was slightly greater than that of the White-winged Scoters, the rounded head, which was distinctly gray on the crown and brownish on the sides, with a prolongation of the maxilla backward on each side toward the eye, the brownish upper neck, wings and lower back, the creamy white lower neck and breast, and the distinct, rounded, white patch on either side of the rump.

The bird dove twice while under observation. The rest of the time it spent swimming about on the outside of the flock of Scoters, often preening its feathers.

Mr. Charles H. Rogers, of Princeton University, who also happened to be at Long Beach, saw the bird too, and the next day he and I compared it carefully with skins of the King Eider in the American Museum of Natural History,—the comparison leaving no doubt in our minds as to the accuracy of our identification.

On June 8, 1924, the writer was again at Long Beach and saw the same bird (presumably) associating with a flock of about fifty White-winged and Surf Scoters.—E. R. P. JANVRIN, M.D., 515 Park Avenue, New York City.

Flamingoes (*Phoenicopterus ruber*) in Florida.—In January, 1924, while collecting about Cape Sable for the Cleveland Museum of Natural History, I learned of a recent occurrence of the Flamingo in Florida waters that seems worthy of record. Three birds were seen about the middle of December, 1923, on Flamingo Bank in Florida Bay by Coleman Irwin, of Flamingo.

Mr. Irwin is one of two brothers, resident for many years in the Cape Sable region, who make their living by fishing and hunting, and both are thoroughly familiar with the more conspicuous birds of that country. One served as my guide and camp-man for a while and my association with both left me with only the highest regard for their trustworthiness. Furthermore both recognize instantly the Roseate Spoonbill, the only other large pink bird possible in that locality, so I have accepted the record without reservation.

Under "General Notes" in the January, 1924, 'Auk' (Vol. XLI, pp. 150-152), Amos W. Butler gives a summary of Florida records of the Flamingo, but omits perhaps the most interesting accounts of the bird in that state. Scott (Ibid., Vol. VI, p. 13, 1889, and Vol. XII, pp. 221-226, 1890) records the killing of four in Tampa Bay in 1885, and in February, 1890, secured three adult females from a large flock of at least a thousand birds in one of three bays about 16 to 18 miles east of Cape Sable. The condition of the ovaries of these birds and the reports of local men led Scott to believe that the flock bred in the vicinity. Dutcher reported in 'The Auk' for January, 1903 (Vol. XX, p. 119), that a similar flock existed in the same region but advanced no circumstantial evidence in support of this bare statement. On the other hand, Henry W. Fowler reporting (Ibid., Vol. XXIII, p. 397, 1906) on the birds observed between Cape Sable and the Marquesas Keys during June, 1904, states that the Flamingo "appeared to be either very rare or probably exterminated. None seemed to have been noted during the last ten years." It is true that Fowler traveled in the wrong direction to encounter Dutcher's flock but the fishermen of Florida Bay, from whom Fowler evidently drew his information, move about freely over the region and it seems reasonable to suppose that

they would be aware of any breeding colony of Flamingoes in their territory. Therefore it seems likely that Dutcher's birds were visitants from the Bahamas.

As the latest published record at my command of the Flamingo in Florida (Mrs. Lucas Brodhead, 'Bird-Lore,' Vol. XII, p. 189, 1910) relates to the shooting of one of only three birds seen on a bank near Upper Matecumbe Key, March 7, 1906, it seems that this magnificent species has finally been forced to withdraw before the ruthless advance of the hordes of tourists and fishermen that in increasing numbers swarm over southern Florida. Flamingoes seen on our shores nowadays are certainly the merest wanderers.—ERNEST G. HOLT, 312 Bell Building, Montgomery, Ala.

Flamingoes in Cuba.—May 2-6 inclusive, 1924, I visited various islands off the north coast of the Province of Camaguey, Cuba, for the purpose of gathering information on the distribution of Flamingoes (*Phoenicopterus ruber*) reported to be in that section of the country. Visits were made especially to the islands of Turiguano, Cayo Coco, and the little group known as the California Islands.

Flamingoes were found in the shallow lagoons of all these islands. The largest assemblage was seen the morning of May 3 on Isla Turiguano where about 700 birds were observed feeding in one flock. All others discovered were in small groups. Old breeding places on all of these islands were visited but the nesting place for 1924 appeared not yet to have been decided upon. All reports indicate that there has been much slaughter of the birds of recent years. Natives take them, especially the young, for food. Something over 1800 Flamingoes were counted on the entire trip.

Among other interesting birds observed in this region were two Great White Herons (*Ardea occidentalis*) and three Limpkins (*Aramus vociferus*) on Isla Turiguano. On this island, as well as in Cayo Coco, Reddish Egrets (*Dichromanassa rufescens*) in the dark, white and pied phases of plumage were seen. Near the latter island breeding colonies of Man-o'-War Birds (*Fregata aquila*), Snowy Egrets (*Egretta candidissima candidissima*), White Ibises (*Guara alba*) and Cormorants were inspected.—T. GILBERT PEARSON, New York City, N. Y.

Hudsonian Curlew in Lake County, Ohio.—There is a certain stretch of beach lying along the south shore of Lake Erie between the Painesville pumping station and Fairport Harbor, about a mile and a quarter in length which has afforded me a great deal of pleasure during the past eleven years. On July 14, 1922, I visited this place and as I approached I saw two large birds in the air which from their long down-curved bills I had no difficulty in identifying as Hudsonian Curlew (*Numenius hudsonicus*). They were flying slowly and easily up the lake and uttered a soft mellow whistle. They soon alighted on the beach and I studied them for some time with my binoculars. They seemed to be uneasy and spent

most of the time watching me rather than in obtaining food. Again the next year, on July 15, I was surprised to find a single Curlew on the same beach feeding with ten or a dozen Spotted Sandpipers. I approached as nearly as I dared and watched him for some time until he finally took wing and flew east over the breakwater. I found him again later and this time as he left the beach he made the "pip, pip," note five or six times in rapid succession as he flew past me.

This year (1924) on the first touch of cool weather on July 10, I walked to the breakwater where I found about seventy-five or a hundred immature Bonaparte's and Herring Gulls, twenty Spotted and one Least Sandpiper. As I returned a Curlew flew from a bunch of Gulls and called "pip, pip," as he took wing. He alighted farther on and was busy preening his feathers as I watched him. On August 1, we had another cool spell and I found a Curlew on the beach, and apparently the same bird the next day. He seemed to be feeding on light colored moths with bodies one-half to three-quarters of an inch in length which had been washed ashore some dead and others still living.—E. W. Hader, Painesville, Ohio.

The Red-backed Sandpiper and Hudsonian Godwit in Oklahoma.

—During the spring of 1924, a large number of shore-birds frequented a shallow pond in a corn field a half mile south of Norman, Oklahoma. We recorded sixteen species of Limicolae here, two of which are new to the State list. The Red-backed Sandpiper (*Pelidna alpina sakhalina*) was seen on only one date, May 15, at which time there was a flock of five in full summer plumage. One was collected and given to the museum of the University of Oklahoma. The Hudsonian Godwits (*Limosa haemastica*) were seen May 12 and 15; four on the first day when one was watched through field glasses for some time at a distance of fifteen feet, and three on the fifteenth. No specimen was secured, as on the first date we were without a gun, and the next time the birds were too wary. However we have found in the University museum three specimens that had previously been overlooked; they were taken by Mr. E. D. Crabb in Canadian County in 1911.

A single Semipalmated Plover (*Charadrius semipalmatus*), observed on May 15, was collected and is the first specimen recorded from the State, the only other instance being a sight record. Other birds of special interest were four Long-billed Dowitchers seen April 5, 6 and 8, five Willets May 12, and four Still Sandpipers May 14 and 15.

Semipalmated Sandpipers were the most abundant species and were seen for the longest period—from April 4 (our first visit to the pond) till June 8 at which date there were still two of these birds as well as two White-rumped Sandpipers. Two days later the last transient shore-bird had left.—MARGARET M. NICE AND L. B. NICE, Amherst, Mass.

Red Phalarope (*Phalaropus fulicarius*) in Africa.—We have received a specimen of the Red Phalarope at the Transvaal Museum, a

male in winter plumage, taken by Mr. R. D. Bradfield in April, sixty miles north of Okahandja, S. W. A. Prot., which seems to be the first record of any Phalarope from Africa. It is surprising that it has not been taken previously in this country, having regard to its circum-polar distribution in the northern summer.—AUSTIN ROBERTS, *Transvaal Museum, Pretoria, S. Africa.*

[We notice that this species has recently been reported from Africa and in Selater's 'Systema' the Cameroon coast is given as its farthest south on this continent. Mr. Roberts had of course not seen this work at the time his note was written and it is mentioned simply to supplement his interesting record.—Ed.]

Phalaropus fulicarius: A New Bird for Alabama.—Recently, while a guest at the home of Mr. Kenneth Underwood, a taxidermist of Montgomery, Alabama, my host showed me a Phalarope skin which he wished determined more specifically. The bird agreed very well with the description of the Red Phalarope given in Chapman's 'Handbook'—the only manual then at our command—but as the specimen was in winter plumage and the species entirely unfamiliar to me I forwarded the skin to Dr. Alexander Wetmore, of the U. S. Biological Survey, for more expert diagnosis. Dr. Wetmore has sustained my identification; therefore the specimen constitutes the first record of the Red Phalarope (*Phalaropus fulicarius*) for the State.

The label on this skin contains the following data: "Pickett Springs, Montgomery, Ala. Last half January, 1924. Male. Shot while swimming on small pond. No other bird of same species observed. Shot by Mr. Dan Holt whilst Duck hunting. Bird restless, constantly bobbing head."

The specimen is preserved in the collection of Mr. Underwood, by whose courtesy I publish this record.—ERNEST G. HOLT, *312 Bell Building, Montgomery, Ala.*

Golden Eagle (*Aquila chrysaetos*) in Alabama.—Some months ago I was informed of the capture of a Golden Eagle in Autauga County, Alabama, but absence on a field trip precluded, at that time, examination of the specimen. On May 23, however, I made a special trip to Prattville to see this bird, then mounted and on exhibition there in the store of Mr. B. W. Moncrief, and found it indeed a Golden Eagle.

Our advent, for the sole purpose of examining the big bird, aroused great interest among the staff of the store who crowded around us, asking questions. One clerk seemed most anxious to know if the bird was really more than a hundred years old, as she had been informed. She seemed quite disappointed when we reluctantly told her that the buffy "boots" and white bases of the rectrices, indicative of immaturity, would hardly sustain the centenarian idea.

The Eagle was killed December 1, 1923, about five miles south of Prattville, by Mr. J. E. Churchill. It was flushed from shrubby growth, where

it had been feeding on a very mellow carcass, and committed the fatal error of alighting on a nearby tree-stub instead of making off. For information of the circumstances of capture I am indebted to Mr. Lewis S. Golsan, of Prattville. We persuaded Mr. Moncrief to donate the specimen to the State Department of Archives and History and it is now in the museum of that institution at Montgomery.

The rarity of the Golden Eagle in Alabama is indicated by the fact that Mr. Howell ('Birds of Alabama,' Montgomery, 1924, p. 138) advances but three records for the entire State—two in northern Alabama and one on the Florida line.—ERNEST G. HOLT, 312 Bell Building, Montgomery, Ala.

The Saw-whet Owl in Yellowstone Park.—One of my friends, while on a trip through Yellowstone Park, picked up, near Panther Creek, a specimen of this Owl (*Cryptoglaux acadica acadica*) and, knowing my interest in birds, sent it to me.

It is in the usual dark, and brownish plumage of the young, and was found on August 4, 1923. This is, so far as I am able to learn, the first record for this Owl in Yellowstone Park.—W. H. BERGTOLD, Denver, Colo.

Burrowing Owl in Northern Indiana.—On April 16, 1924, while on a field trip with Leon L. Walters and Karl P. Schmidt, both of the Field Museum of Natural History, I shot a Burrowing Owl (*Speotyto cunicularia hypogaea*) at Dune Park, Porter County, Indiana.

The day was sunny but cold and a high wind was blowing. Few birds were to be found except in the more sheltered masses of woodland. While searching for perches suitable for bird mounts on an openly wooded hillside, just above the Dunes Highway and nearly opposite Dune Park Station on the New York Central Railway, I flushed an Owl from the ground, among some pine branches. Recognizing it as a Burrowing Owl, I secured the shotgun, flushed the bird again and brought it down.

It proved to be a male, now in the collection of the Field Museum of Natural History, in excellent plumage and in good flesh, with no sign of having been kept in captivity. This species has a wide range west of the Mississippi, but it does not appear to be recorded from Illinois, and I believe this to be the first record of its occurrence in Indiana. Other accidental records from New York and Massachusetts are known.

It is possible, though perhaps scarcely probable, that this occurrence of the Burrowing Owl in the sand dune area of northern Indiana is a fore-runner of an actual colonization of this area by this form. Such an extension of its range would parallel the eastward spread of Franklin's *Spermophile* (*Citellus franklini*) and of the Plains Garter Snake (*Thamnophis radix*).—ASHLEY HINE, Field Museum of Natural History, Chicago, Ill.

Pileated Woodpecker in the Helderberg Mts., N. Y.—Although Eaton's 'Birds of New York' does not mention the fact, the Pileated Woodpecker is a resident of the Helderberg Mountains of Albany County,

N. Y. Visitors to John Boyd Thacher Park will find them in the wilder portions of the hemlock forest at an elevation above 1300 feet.

Here hundreds of trees are to be viewed showing the great chiseled feeding holes—some freshly made, with the splinters still sticking to the sides of the trunk; others on old, fallen, punky logs, made at least fifty years ago.

All evidence shows that this bird has been a resident continuously.—
EDGAR BEDELL, *Waterford, N. Y.*

Kingbird (*Tyrannus tyrannus*) in New Mexico.—On August 13, 1923, I saw four Kingbirds in an orchard in Velarde, a small town at the mouth of the Rio Grande Canyon about forty-five miles north of Santa Fe. Two of the birds were adults, and were feeding the other immature birds. These had probably been raised near the same place, and very likely in the same orchard.

On August 15, I again found the birds in the same place, and on August 21, a Kingbird visited my garden at the United States Indian School two miles south of Santa Fe, for only a few minutes. I saw it go to a strawberry bed and eat some of the ripe fruit, and take a few honey bees from the front of a hive in the garden.—J. K. JENSEN, *U. S. Indian School, Santa Fe, New Mexico.*

***Tyrannus verticalis*, a new bird for Illinois.**—R. A. Turtle, a Chicago taxidermist, phoned me to come over to his shop and identify a strange bird, which proved to be a fine male *Tyrannus verticalis*, brought to his studio by Prof. Wright of Highland Park to be mounted for the Lincoln School Collection. The bird was picked up dead on the road between Deerfield and Highland Park by Dorothy Clark, a school girl, on June 6, 1924—and is the first authentic record for Illinois.—HENRY K. COALE, *Highland Park, Ill.*

Least Flycatcher in the Ozarks.—Mr. Otto Widmann, in his catalog of Missouri birds states that the Least Flycatcher (*Empidonax minimus*) is a common transient visitant in the state of Missouri, not being known to breed within the limits of the state. Tindall, according to Mr. Harry Harris, collected eggs of the species at Independence, Mo., in 1891. Since other bird students have possibly found the species breeding within the state I can not claim any discovery, but wish to record that I found the species breeding in Lawrence County, Southwest Missouri, in 1923, and that it is again present in 1924.

About August 10, 1923, I located in a young apple tree the nest of a small Flycatcher previously unknown to myself. It contained three totally white eggs. I was very busy at the time, and before I was sure of my identification the eggs had hatched. I banded these young birds on August 18. About August 15, 1923, I was very lucky in finding a second nest only a hundred yards away from the location of the first. It held four spotless white eggs. This time I took the necessary time to study the

nest, eggs and adults. Also I corresponded with Mr. Widmann concerning my find. After some study I find myself convinced that the nests were those of the Least Flycatcher. The latter brood was banded on August 23, 1923.

Mr. Widman stated in my correspondence with him that this record not only confirmed the breeding of the species in southwestern Missouri, but also extended its breeding range some two degrees of latitude, from 39° to 37°. During this 1924 season I have heard and seen the adult birds occasionally, but have been unable to institute a close search for their nests, which I feel sure are located somewhere in the orchards in which they nested last season.—JOHNSON A. NEFF, Marionville, Missouri.

Decrease of the English Sparrow in Eastern Massachusetts.—

In checking statistical observations of *Passer domesticus* in eastern Massachusetts from November, 1914 to June 1922 inclusive, during which period I kept a careful and, so far as possible, accurate account of every bird seen at any time, I found that my records confirm, in striking fashion, conclusions derived from other sources. The following statistical chart will be self-explanatory but certain qualifications are necessary.

The average number of individuals seen per day when a species is observed I believe to be far more conclusive than the percentage of days seen unless one is devoting all one's energies to looking for a particular species. In other words the variable factor, *i. e.*, time in the field is to a large degree eliminated, and you do not count the same birds indefinitely.

Date	Days on which Sparrows seen	Total of individuals	Average per day
Nov. 20, 1914–Jan. 1, 1916	207	2705	13.7
1916	232	2488	10.7
1917	181	1478	8.2
1918	194	1311	6.8
1919	221	1343	6.2
1920	144	871	6.0
Jan. 1, 1921–June 28, 1922 ¹	101	570	5.6

From November, 1914 until July, 1918, most of my observations were confined to Weston, Mass., and in the summers to Brewster, Mass., with two or three intervals of a week or so outside the state, which have been discounted. From September, 1918 to June 1922, I lived in Cambridge with many trips in the vicinity of Boston and to Cape Cod. I have purposely excluded the summer records of 1921 for they covered portions of Rhode Island—although if included the general trend would only be accentuated.

Taking as an hypothesis that the English Sparrow has remained stationary in numbers one would expect to find that in the second period the number of times and the number of individuals seen per time would

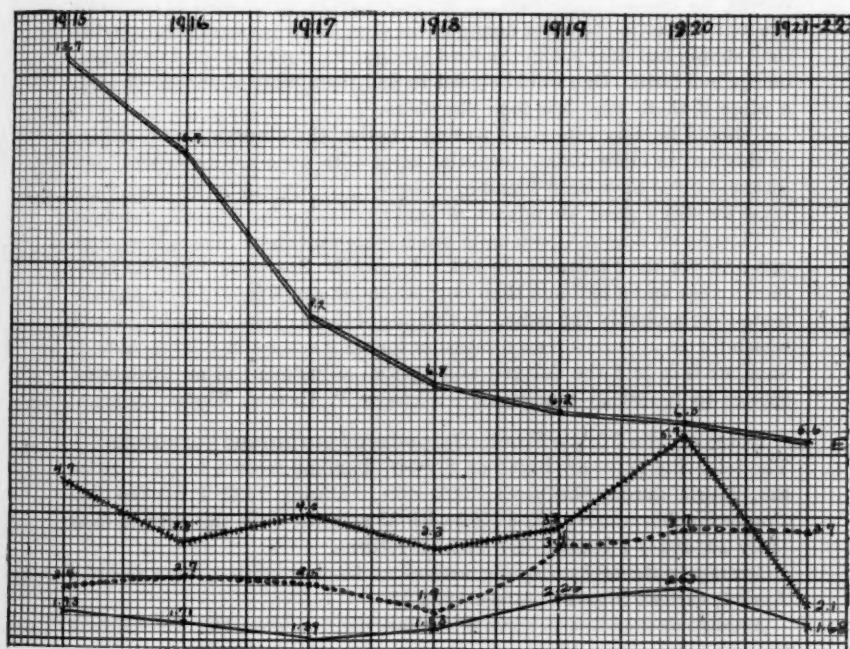
¹ Summer of 1921, July–Sept., spent in Rhode Island.

increase rapidly as the country covered in the second period was much more favorable to the Sparrow to the exclusion of everything else.

On the contrary, a glance at the table will indicate that although the birds were seen more times in 1919 than in the two preceding years, yet the number seen per time was appreciably less. In other words the graph indicating the number of individuals seen each time the species was observed shows a steady but rapid decrease for eight years. That this decrease was unique and not due to variation in the number of times in the field is brought out by comparison with native permanent residents, the Blue Jay, Crow and Chickadee which are roughly as follows:—full details are omitted from lack of space—see graph.¹

	Blue Jay	Crow	Chickadee
1915-1917	1.74	4.05	2.56
1918-1919	1.86	3.47	2.61
1920-1922	2.13	4.04	3.69

It is clear, then, that using relative means of comparison, the English Sparrow has become much less common than three native and comparable species in the period and region considered. The decrease might roughly be placed at 50 per cent but, since the latter four years covered observations



¹ Uppermost curve, English Sparrow. Others in order, Crow, Chickadee and Blue Jay.

mainly in urban sections of Boston, Cambridge, Belmont, Brookline, Waltham, etc., I should estimate the loss at anywhere up to 75 per cent. In other words I believe that where I saw, in 1915, a flock of 13 to 14 birds together, I would have expected in 1922 to see only 3-4.

My conclusions are borne out by statements of others. In November, 1917, an observer in Weston, located on a poultry farm where feeding conditions were favorable, reported that there were "fewer Sparrows than formerly." An observer from Lexington commented in 1922 on the scarcity of this very common species which reached its climax, I believe, in the summer of 1922. At this time the down-town section of Boston was almost free from these pests so that on July 27, I considered it worthy of note that I had seen three in Winthrop Square. Since this time I have every reason to believe the birds have come back slowly and during the present winter I have watched for them carefully. In Weston, there are several flocks, not large or well distributed; in Boston I can usually find 25-30 without difficulty, but I do not believe they compare in numbers with, say, eight years ago.

My personal reaction to the cause of this change inclines toward the theory that some disease of overcrowding has attacked the species. Of course, the natural adjustment to the food supply would tend to cut down the numbers owing to fewer horses in the city. This removes a very fertile food supply but does not in the least account for the reduction in numbers on the hen farm. One would expect to find them more abundant on such a place if there were less food elsewhere.

I should be very interested to find whether the observations of others in this and in more distant localities agree with mine and to know if any diseased birds have been found or collected. It appears to me that there must be still a great abundance of food available—for example the flock of Pigeons on Boston Common is much more numerous than a few years ago and yet the Sparrows are not. Again, the Sparrows were less common a year and a half ago than now, although conditions of food and climate were probably the same. Is this one of those cycles in the bird world which for no apparent reason raises or lowers a species in relative abundance, or is it just the delayed and natural adjustment of an introduced species to American conditions?—WARREN F. EATON, *Weston, Mass.*

Notes on the Purple Finch (*Carpodacus purpureus purpureus*).—The following notes are based on my bird banding records made at Sault Ste. Marie during the years 1922-1924. During 1922 I banded 248 Purple Finches; during 1923, 1092 with 33 returns, while this year to date (July 20, 1924) I banded 697 with 83 returns.

Average date of first spring arrival at feeding station, nine records, April 7, earliest March 7, latest April 22.

Average date of last to leave in the fall, eight records, Oct. 28—earliest Oct. 18, latest Nov. 17.

Early in Feb., 1923, a small flock of about six was seen in town feeding

on mountain ash berries and on Feb. 22 saw a male at Brevort Lake about 50 miles southwest of Sault Ste. Marie, also feeding on mountain ash berries. Feb. 24, 1924, one male was reported in town. These are all our winter records to date.

The first arrivals are mostly crimson males. My records for nine years show a crimson male to be the first in to feed every year but one. My banding records show for first five days of banding: 1922, out of eight banded, seven were crimson males; 1923, out of 32 banded, 25 were crimson males; and this year out of 16 banded, 13 were crimson males.

In the fall there is a tendency for the sexes to flock separately. Several times late in the fall flocks of from twenty to thirty, all crimson males, have dropped in for from a few hours to a day or two and then moved on. The following is from my 1922 notes: "Have not had a crimson male at house from Aug. 23 to Oct. 4," and my banding records show that after Aug. 7 I banded no crimson males although I trapped and banded 111 birds.

At least some of the Purple Finches that summer in this locality go as far south in winter as Tennessee, as is shown by No. 118,680, a young male or female, banded Sept. 4, 1923, which was found dead May 1 at a farm house three and a half miles south of Sparta, Tenn.

June is the nesting month, and I have had young in window box being fed by the old birds as early as June 15, but the great majority of young birds show up from July 1 to 15.

Many males mate and nest before acquiring the crimson plumage. I have frequently had young birds in my window box being fed by old birds, both of which were in the brownish-gray plumage.

First signs of moulting are noticeable about July 1 and moulting birds are present well into September. In fact I have seen a number of birds in October with outer tail feathers but half grown out.

Most bird books give this bird a rather bad reputation, "Of doubtful utility," "the most confirmed bud-eater of all our birds" etc., etc. I have three old apple trees on my lot, one of them just beside my bird bath and within a few feet of my traps. Since 1916 the birds have been in and out of these trees from early spring to late fall and have done no harm. Last year more of the birds were here than ever before and my trees never had more or better apples, hardly a wormy one in the lot. I doubt if their budding does any harm, certainly not to apples in any event.

The following report on plumage should be considered simply as a preliminary report. To make a definite report will require my records for the balance of this year and probably a check on returns next year.

Adult Male.—Most, if not all, do not acquire the crimson plumage until two years old and then it is not the perfect plumage of the old male. I believe the very bright crimson males are at least four years old.

Birds banded as adult males early in 1922 that returned this year are all in very bright crimson plumage.

Birds banded in the spring of 1922 as young males or females that were

crimson males on their return in 1923, on their return this year are bright but not so highly colored as the birds that were crimson males early in 1922.

The birds banded early in 1923 as young males or females that returned this year as crimson males have not so much crimson and it is not so bright.

In the spring the skin at the sides of the mouth of crimson males is from yellowish to deep yellow. As a rule the more highly colored the bird the deeper the yellow. When moulting this skin becomes bright deep orange to red and in many the color extends to the roof of the mouth, later the color fades and late in the fall is from orange to orange-yellow. The first old male I noticed with skin at sides of mouth red I thought had struck a wire of the trap and that the mouth was bleeding.

Immediately after moulting the crimson males are very much lighter in color. Many, particularly on the rump, much nearer "Old Rose" color than crimson. They soon darken but up to the time they leave are not as dark or rich in color as the spring birds.

Female and Young Male.—These birds all have the same general appearance but vary much in shading,—from quite dark brownish-gray, through lighter coloring showing no olive or yellowish cast, to birds quite light showing olive or yellowish up to quite dark birds with a distinct olive or yellowish cast.

The shadings on rump vary much more than the balance of plumage—from rump as dark as back with no yellowish, to rump considerably lighter than back with no yellowish, then from rump with just the faintest yellowish tinge (so faint on some you are doubtful if there is any) to a very distinct and bright yellowish-olive.

I am pretty well satisfied that the darkest birds showing no yellowish are old females and those at the other extreme with very bright yellowish olive rumps are young males. In between there is a vast range of shading and I do not believe the young males can be picked out. I find very few birds showing any decided chin markings and then it is a brownish-buff or tan rather than olive-yellow. The yellowish or olive-yellow rump, except in a very few cases where it is unusually bright, my records show, is no proof the bird is a male.

Nos. 76,193, 59,682, 78,425, 59,606, 76,159, 78,423, 76,188 and 78,185 banded last year showed no decided yellowish on rump and no tan on chin. I took them to be adult females. This year however they all returned as crimson males.

No. 18,091, banded July, 1922 as a young male or female, returned May 21, 1923 with rump quite yellowish. Put down as probably a young male. It returned May 9 this year, with no yellowish on rump.

No. 103,653, banded August 7, 1922 as young male or female, returned May 14, 1923, with no decided yellowish; I thought it probably a female but it returned May 21 a crimson male.

Last fall I noticed quite a number of birds not only with more or less yellowish on rump but with broad markings of brownish-buff or tan on the

breast and sides. It reminded me of iron rust and looked as though the color had run down the shaft staining the whole feather. I thought these birds were surely young males until returns came in this year, *i. e.*

No. 119,889, banded October 10, 1923, showing all these markings, returned May 13 showing no yellowish on rump and no broad markings breast and sides.

No. 118,823, banded September 19, 1923, returned May 12 still showing yellowish on the rump, but the breast and side markings were gone.

No. 85,417, banded September 26, 1923, returned May 18 with no yellowish on rump and no broad markings breast and sides.

No. 30,622 banded July 11, 1922 as young male or female. September 25, 1923 rump yellowish and broad markings breast and sides. Returned May 19, without these markings, probably an adult female.

To show the great variation in the markings of the young birds I record the following, and as only birds trapped before June 1 are reported, there can be no possibility of the plumage being at all affected by moulting.

No. 76,205 banded July 11, 1923 as young male. One feather on back and two on rump slightly tinged red. Repeated July 22 showing a few more red feathers. On return May 23, rump slightly yellowish, but no more red than on July 22, 1923.

No. 119,944 banded April 22, crimson male except rump bright yellowish-olive.

No. 119,956 banded April 27, no yellowish on rump, one feather on throat and one on upper breast tinged red.

No. 120, banded May 7, no yellowish on rump, a few feathers of chin reddish tan.

No. 74,410 banded May 12, rump distinctly yellowish, one feather reddish.

No. 87,308 banded May 12, fine reddish feathers on back, scapulars and wing coverts. Would not be noticed except in hand. Rump just a faint tinge of yellowish.

No. 76,610 banded May 12, decidedly yellowish tinge all over. Fine reddish tan feathers on chin.

No. 212,254 banded May 12. Fine reddish tan feathers on chin, no yellowish on rump.

No. 135,727 banded May 13. A few reddish feathers on back, wings and rump. No yellowish on rump.

No. 135,751 banded May 15. No yellowish on rump. A few feathers on throat tinged red.

No. 135,788 banded May 16. Decidedly yellowish all over.

No. 135,823 banded May 17. A number of brownish-buff or tan feathers on breast.

No. 135,845 banded May 17. Some feathers on bend of wings and one feather on rump reddish. Throat and breast brownish buff or tan. No yellowish on rump.

No. 135,846 banded May 17. Upper tail coverts bright yellowish.

No. 135,880 banded May 18. No yellowish on rump. Chin brownish-buff or tan.

No. 135,885 banded May 18. Very yellowish rump. One reddish feather chin.

No. 135,904 banded May 18. A few reddish feathers rump and upper tail coverts. No yellowish on rump.

No. 135,917 banded May 19. Yellowish rump. A few feathers breast tinged reddish.

No. 135,919 banded May 19. A number of reddish feathers rump. Throat slightly tinged, brownish-buff or tan. No yellowish on rump.

No. 135,949 banded May 20. No yellowish on rump. Throat tinged brownish-buff or tan.

No. 268,273 banded May 21. Some very bright yellowish feathers rump. Two reddish feathers upper tail coverts.

No. 137,212 banded May 26. No yellowish on rump. A few reddish feathers back right eye. —M. J. MAGEE, 603 South St., Sault Ste. Marie, Michigan.

Notes on the Breeding of the Carolina Junco (*Junco hyemalis carolinensis*) in the Mountains of North Carolina.—It has been my custom for several years past to spend a certain amount of time in the mountains of western North Carolina, and the bird life of this region has always claimed my attention, and many interesting observations have been made from time to time in connection with the breeding of birds which frequent the higher ranges of the Blue Ridge Mountains.

If I were called upon to name any one species that seems to typify the country in general, I would unhesitatingly chose the Carolina Junco as the representative.

This form was named and described by Mr. Brewster in 'The Auk,' for January, 1886, p. 108, and the type locality given as Black Mountain, Buncombe Co., North Carolina. The writer's family has a summer home three miles from Black Mountain, a station on the Southern R. R. eighteen miles east of the city of Asheville, and it is in this locality that much of the bird work which I have done in the state has been carried on. However, there is another region between ninety-five and a hundred miles northwest of Black Mt. where I have seen and studied the Carolina Junco in much greater numbers, and where it is really to be found in multitudes during the breeding season. This locality lies in the county of Watauga, and contains the summer resort of Blowing Rock, which is well known over the East for its magnificent scenery. It is here that the following notes were made, and I doubt whether another spot in the state has its equal for the opportunity of the observation of this form.

The village of Blowing Rock has an altitude of 4000 to 4600 ft. and could rather be termed *on* the mountains than *in*, as it is built on the crest of a very high ridge and the beautiful motor road which connects it with the Southern R. R. at Lenoir, N. C., presents twenty-two miles of

some of the grandest pictures of nature that it has been my good fortune to see. This then, the top of eastern N. A., is the home of the Carolina Junco. It very rarely descends under 3000 ft. and in the vicinity of Black Mt. I have yet to see it below 2800 ft. It is fairly common in that section above the latter altitude, but never comes down into the valleys there, as I have not observed it for twelve years under 2800 ft. Of course its habits during the winter months change, and it doubtless comes down to feed during the heavy snows, but the time of year to which I had reference was the breeding season, and late summer. I have never yet had the opportunity to work in this section during the winter.

It would be hard to estimate the numbers that are to be met with in even a short walk anywhere in this region. They fly up in front of one in every direction and seem to delight in the companionship of their human friends. The sharp call note which resembles the word "tsip" is always recognizable, and every brush pile and thicket resounds with the busy notes. The food of this form consists of various seeds and insects, and is procured on or near the ground. They have a liking for rather dark, thick, bushy places where the ground is soft, and may be seen scratching away among the leaves and earth like so many miniature barn yard fowls, and flitting here and there, showing to advantage the conspicuous white tail feathers. This mark is always evident, whether the birds be in dark or light locations. While feeding they utter a subdued sort of twittering note carried on in a hushed undertone. The song is rather simple in quality, a soft little trill, with a melody in it which grows upon one when heard repeatedly, rather than impressing itself as possessing sweetness at the outset. They also have a three syllabled whistle which is sometimes uttered in flight.

The nest is commenced during the second week in May in normal seasons, and the building usually consumes from ten to twelve days. Full sets of four eggs may be had by the 21st or 23rd of the month. The situation generally chosen is under an overhanging bank where there are many hollows between roots and stones, but there is a wide choice in locations, which are at times very peculiar. An example of these is a nest I examined in July, 1921. It was built in a large tin can at the base of a small white pine on the edge of a tennis court, in the grounds of my father-in-law. The court was frequently in use, but the birds minded us not at all, a game of tennis disturbing them no more than a mountain breeze. This is of course unusual, the great majority considering a sheltering bank good enough for the purpose. The nests are very well made, and in most cases well concealed, but a bird flying out from the edge of a small declivity usually means a nest found without much trouble. The materials used are grasses, bits of bark, rotten wood, moss, rootlets and invariably horse hair, which in many cases is white. The nest is deeply cupped, and when plastered with moss and lined neatly with white horse hair, presents an attractive appearance.

The eggs number four, sometimes five, while I have never found more

than three at the second laying. The second set is laid during the second or third week in July, my latest record being July 20, when I found a nest with three fresh eggs. The eggs average somewhat larger than those of the Slate-colored Junco, but have much the same appearance, being white or greenish white, speckled with dots of reddish brown with a few shell markings of lavender, the dots sometimes assuming the shape of a wreath at the large end. They measure, in a series of several sets, 77×56 , 77×57 , 78×56 , 78×58 mm.

During this past July I collected a very beautiful nest with three eggs. The nest was built at the base of a small pine, and was on the ground, being built up from it in a very substantial manner; the bird had utilized small clods of dirt, grasses and moss to build up the foundation and sides of the nest, the extreme height being just under six inches, and the breadth at the widest point $4\frac{1}{2}$ ins. The inside diameter is 2.5 ins. and the depth of the cup 1.8 ins.; the bottom of the cup is four inches from the ground. The whole is covered with ground moss, and the interior beautifully lined in gray horse hair.

The Carolina Junco betrays very little, if any, excitement while its nest is being investigated. It may sit nearby and utter the sharp call note at times, or may fly quite away, seeming to take very little interest in the proceedings. The readiness with which it breeds near houses is noteworthy. I found a nest this past summer, about two feet from the side of a constantly travelled road, and within twenty-five yards of the porch of a large hotel. They frequently nest in the front yard of my father-in-law's home, one large laurel bush holding the nest of a Chestnut-sided Warbler, and about five feet below and to one side was a nest of this Junco. They seem to be totally indifferent to human habitation, and I will go so far as to say that it looks as if they prefer it in some instances. Certain it is, that I have found far more nests within the confines of the town of Blowing Rock, than I have in the surrounding country about it. They do, of course, breed in the wild ravines and slopes, far from human habitation, but they are a very sociable form, and as I say, seem to enjoy the companionship of man.

I have visited all of the higher peaks of the North Carolina mountains, and the Junco is ever present to welcome the wanderer with its sociable ways and cheery song. I think I will always remember a cold foggy morning on the top of Mt. Mitchell, the highest peak east of the Rockies, 6711 ft. when all the world seemed blotted out in fog, and a cold damp wind blowing from the north, when one of these indefatigable little birds took shape out of the mist and, flying to the top of a huge rock, poured out his happy song. They are typical spirits of these majestic mountains, and I hope I have many good times awaiting me in the future with my friends, the Carolina Juncos.—ALEXANDER SPRUNT, JR., 92 South Bay Street, Charleston, S. C.

Junco Nesting in Dutchess County, N. Y.—In the County Tables in Eaton's 'Birds of New York,' the Junco is given as a summer resident of Dutchess County. A constant lookout failed to verify this statement until this year, when, on June 15, we were returning to our car from a climb in the neighborhood of Bald Mountain, near Wingdale, through a well-wooded area of fair extent. While scrambling down a dripping wet cliff we heard a bird chirping and, on discovering it to be a Junco, we retreated a short distance, whereupon it immediately flew to its nest, containing four eggs, at the foot of an elm sapling about thirty feet from the base of the cliff.—MAUNSELL S. CROSBY, ALLEN FROST, KENNETH FLEWELLING AND LUDLOW GRISCOM, *Rhinebeck, N. Y.*

Trapping of Lincoln's Sparrow in Pennsylvania.—The trapping of a Lincoln's Sparrow (*Melospiza lincolni*) near my home in Glenolden, Pa., on May 25, 1924, should be of interest to bird banders residing in the Carolinian Faunal region. This individual was captured in one of my traps together with a Song Sparrow (*Melospiza melodia*). Before examining the bird I mistook it for an immature Song Sparrow, for, though it was smaller in size than its companion, the crown and general appearance of the upper parts resembled *Melospiza melodia*. Miss Mary Wood Daley of Darlington, Pa., who was holding the bird in her hand prior to banding, remarked that it was not a Song Sparrow. A glance at the bird's underparts was sufficient to verify her statement. The breast and sides were finely streaked, and the buffy sides, cheek stripes and breast band were plainly evident. After consulting available literature we were satisfied that it was a Lincoln's Sparrow; nevertheless, the following day I examined skins at the Academy of Natural Sciences in Philadelphia, and verified the identification. Three days later this same individual was recaptured in our yard, not thirty feet from the house.

In time, bird banding may prove that unusual species are more common in a particular vicinity than is generally supposed. It is quite likely that the field observer, working under difficulties during the rush of spring and fall migrations, passes by the unusual species as individuals of more familiar species, which they resemble.—JOHN A. GILLESPIE, *Glenolden, Pa.*

Cliff Swallows Return to Brookfield, Mass.—Until this spring (1924) Cliff Swallows (*Petrochelidon lunifrons lunifrons*) have been known to me only as I have singled out individuals among migrating Swallows but in my father's boyhood they were very common about here.

One colony selected my grandfather's barn, doubtless for its exceptional jet and close proximity to the Quaboag River. These birds were so useful in destroying insects about the place and so interesting to watch, as they rolled their little clay pellets on the river bank to fashion the strange retort shaped nests, that when the available space on the barn had been used, grandfather provided more nesting sites by nailing cleats on the shed. Later when the shed space was covered and the birds persisted in placing their nests on the house they became such a nuisance that father

was pressed into the service to knock the nests down. Thus one large colony was completely wiped out.

Other colonies about here were also broken up and this cause together with the advent of the English Sparrow probably forced the Swallows to leave this vicinity. That was in the early sixties.

In late May I discovered some Cliff Swallows flying over the river meadows and soon father and I found the colony. The birds were building on a barn near the head of Quaboag River and Lake. On questioning the owner, it was found that a few scouts had stopped there last year. We saw that much of the mud for the nests was obtained about a watering trough in the barn yard.

On June 2, I counted fifty nests on the west side of the barn and a few scattered ones on the east side. Some of these nests were broken when I visited the spot June 19. There were young in the other nests and the adult birds were busy carrying food to them.—CLARA EVERETT REED, Brookfield, Mass.

A Summer Occurrence of the Bohemian Waxwing in Colorado.—My friend, Major W. E. Selbie, U. S. A., tells me that he saw a single individual of this species (*Bombycilla garrula*) on July 13, 1924 at Lost Park (Lincoln Park, U. S. Geological Map). This lake is at an altitude of about 12,000 feet, not far above timber line, near the east foot of Mt. Evans. The nature of the country and timber are exactly such in which one would expect to find breeding Bohemian Waxwings if any where in Colorado; Major Selbie states that the bird he saw acted as though it had a nest in the vicinity.

It is possible that a few of these Waxwings remained permanently in the State and became summer residents in the high altitudes, after the main portion of the great wave of Waxwings in 1917, and the immediately following years, had gone north. The paucity of experienced observers in these high, somewhat inaccessible, fields would explain why none of these Waxwings have been reported as being in Colorado in the summer.—W. H. BERGTOLD, Denver, Colo.

Golden-winged Warbler in Canada.—It may be of interest to at least your Canadian readers that on May 31, 1924, the writer identified in this city, which is about 55 miles due north of the north shore of Lake Erie, a male Golden-winged Warbler (*Vermivora chrysoptera*). Identification was made by sight through 8-power Busch prismatic field-glasses at a distance of between thirty and forty feet. All distinctive markings were observed, and so far as I can ascertain this is the first record of this species in this locality, which is beyond its usual range.—HENRY HOWITT, Guelph, Canada.

Prairie Warbler Nesting in Dutchess County, N. Y.—Hitherto the Prairie Warbler has been recorded only as a rare transient in Dutchess County. Our only previous records are: May 2, 1913, Poughkeepsie

(Frost), May 23, 1915, Poughkeepsie (Frost), September 24, 1916, Turkey Hollow (Clinton G. Abbott), May 18, 1924, Thompson Pond, Pine Plains (Walter Granger and Robert Cushman Murphy). On June 11, 1924, while preparing supper at the south end of Schaghticoke Mountain, near Webatuck, at a point along Ten-mile River where it is only a quarter of a mile from the Connecticut state line, we saw a male Prairie Warbler singing in a small tree only a few rods from camp. A careful search next day revealed its nest in process of construction in soft maple brush beside the main road, on a rather steep bank, the nest being about four feet above the top of the bank. Both birds were present. On June 22, Frost returned to the spot and found that the nest contained three eggs. On June 29 it contained two eggs and one young bird. Three or four days later Frost again visited the nest, to find that a rapidly-growing grape-vine had turned it over and without question the young brood had perished. The adults had disappeared.—MAUNSELL S. CROSBY, ALLEN FROST and KENNETH FLEWELLING, *Rhinebeck, N. Y.*

A House Wren Adopts a Family of Young Black-headed Grosbeaks.

—On June 26, 1924, a neighbor who had been enlisted to watch the birds notified me that a House Wren had a nest of young in his apple tree. Knowing that Wrens do not nest in the tree foliage I went to his place at once, and found a nest of the Black-headed Grosbeak containing three young apparently about three or four days old. The female Grosbeak was on the nest and a House Wren was bringing small caterpillars to her, which she took from the Wren's beak and fed to her young. At first it seemed to me as though the Wren was liable to be cited as a co-respondent, but soon the male Grosbeak came and relieved his mate on the nest, yet the Wren continued to come with food which the male Grosbeak likewise received and fed to his young. Thus the Wren's status was fixed as a "friend of the family." However it was noticeable that while the Wren lit on the nest close to the female Grosbeak it was somewhat shy of the male, standing farther away on the limb and stretching its neck to the full length to deliver the food. Both of the Grosbeaks sometimes themselves ate the Wren's offerings, in place of feeding them to their young. The Wren made more trips to the nest than both Grosbeaks combined, but did not carry so many caterpillars on a trip.

This whole performance seemed so odd and unusual to me that I feared my account might be doubted, and I therefore telephoned Dr. W. H. Bergtold who came and watched the exhibition with great surprise and interest. On July 3, the young birds were banded by Dr. Bergtold.

They refused to remain in the nest after being banded. That night was unusually cool for the season, yet the next morning I found two of the young birds perched on some loose brush, where they were being fed by the Wren and the female Grosbeak. To make this record complete it should perhaps be added that a Wren came on May 12, and took possession of a double bird house about thirty feet distant from the tree

whereon the Grosbeak later built. He (I assume it was a male) filled both compartments with preliminary nesting material, but, apparently not securing a mate, lingered until he was found feeding the Grosbeak family.

The explanation seems plain, *i. e.*, that his family instincts made him care for other young when he had none of his own, and this seems all the more plausible when it is further remarked that on July 25, as I went to destroy the nest of a pair of English Sparrows which had appropriated a Bluebird house, I discovered my Wren feeding this family of young Sparrows. The place is 200 feet from the Grosbeaks' nest. I have great regard for the Wren, and would do almost anything for it, but I could not encourage it in such misguided philanthropy. The Sparrows' nest was destroyed, and I waited at a little distance to watch developments. The Wren came with food four or five times. It put its head into the hole of the nest box but would not enter when it found the box empty. The Sparrows came into the surrounding trees but would not approach the nest box while I remained in sight. I shall await this Wren's adoption of another family with keen interest.—VICTOR G. HILLS, 2678 Hudson St., Denver, Colo.

Behavior of Black-capped Chickadees during the Winter of 1923-1924.—Two groups of Black-capped Chickadees (*Penthestes a. atricapillus*) trapped at Highland Park, Rochester, N. Y., were remarkable from the fact they repeated for three months, only at the station where they were banded although the distance between the two stations was only 835 feet. The environments of the stations were, however, entirely different, one being near deciduous trees and shrubs and the other in the evergreens.

Sub-stations A and E, only a few feet apart, can be treated as one; these were drop traps operated in the yard near my residence in Highland Park with deciduous shrubbery and trees nearby and only one small group of evergreens anywhere near. It was visited by five Chickadees as follows:

No. 38686, banded Dec. 30, 1923, repeated Jan. 27 and Mar. 2, 1924.

No. 38687, banded Dec. 30, 1923, repeated Jan. 1 and 16, Feb. 25 and Mar. 26, 1924.

No. 38688, banded Jan. 1, 1924, did not repeat.

No. 38689, banded Jan. 6, 1924, repeated Jan. 10.

No. 38690, banded Jan. 15, 1924, repeated Feb. 13 and 24.

Sub-station J. Window shelf trap at the Herbarium of the Department of Parks in Highland Park, in the edge of the Pinetum, with the surrounding trees and shrubs evergreen with the exception of a few deciduous trees to the east. This is 835 feet north over the brow of the hill from the other trapping station. This station was placed in operation the middle of January and was visited by the birds before that as a feeding shelf. Sunflower seed and bread crumbs were the bait that attracted the Chickadees, and I was surprised to observe their liking for the latter.

Eight birds were banded here as follows:

No. 32151, banded Jan. 21, 1924, repeated Jan. 30.

No. 32152, banded Jan. 21, 1924, repeated Jan. 24 and 30, also Feb. 1, 2, 4, 8 and 12.

No. 32153, banded Jan. 21, 1924, repeated Jan. 26 and 30, Feb. 7 and Mar. 19.

No. 32154, banded Jan. 22, 1924, repeated Feb. 12.

No. 32155, banded Jan. 23, 1924, repeated Feb. 7 and 11.

It will be noted that three of these were banded on the same day and the others on the two succeeding days and possibly belong to one family group of five.

Three were banded at J. later but did not repeat, viz.:—32156 on Jan. 28, 32157 on Feb. 4 and 32158 on Feb. 26, 1924.—R. E. HORSEY, *Highland Park, Reservoir Ave., Rochester, N. Y.*

Common Names of the Robin.—In his interesting paper entitled "The Pennsylvania German Names of Birds," which appears in 'The Auk' for April, 1924, pp. 288-295, Prof. Herbert H. Beck states (p. 295): "Omshel is probably the only other commonly used name for *P. migratorius* besides the more general one based on the Puritanic identification of the bird with the English Robin."

According to the census of 1921 there are in Canada more than 2,450,000 persons of French origin, of whom 1,889,000 are in the Province of Quebec. Nearly all of these people speak the French language. English and French are jointly the official languages of Canada, and in the Province of Quebec, French is the preferred language, in which, for example, the majority of speeches and bills in the Provincial Parliament originally appear. French is the language of much the greater part of the educational system of the Province of Quebec, including some leading universities; consequently many of the people of that province know no other tongue.

These French-speaking people live within the range of *P. migratorius* and are familiar with that species. They commonly designate it by the name of "Merle," which would therefore appear to be in both more general and more standard use than the name Omshel.—HARRISON F. LEWIS, *Ottawa, Canada.*

Some Notes from Michigan. *Otocoris alpestris*.—HORNED LARK.—Two adult males of this species were collected at Waterloo in Jackson County, one on November 3, 1923 and the other on November 18, 1923. The latter has been identified by Dr. Alexander Wetmore.

Vermivora pinus. BLUE-WINGED WARBLER.—A male was collected at Ann Arbor in Washtenaw County on May 17, 1923. A second male was seen on the 20th and was observed for several minutes in a patch of hazelbrush. The bird was singing and may have remained to breed. A male was collected at Waterloo on May 18, 1924.

Vermivora celata. ORANGE-CROWNED WARBLER.—The Orange-crowned Warbler was quite abundant at Ann Arbor during the spring of 1924.

Specimens were collected and others positively identified. On May 3, the first specimen, a male, was seen and collected. From the 8th to 12th they were most numerous when four or five were seen daily. The last specimen was noted on the 25th.

Geothlypis formosa. KENTUCKY WARBLER.—A male was taken at Ann Arbor on May 7, 1924. This is the fourth positive record for the State.

Thryomanes bewickii. BEWICK'S WREN.—A female was collected at Waterloo on May 12, 1923.—WALTER KOELZ, *University of Michigan, Ann Arbor, Mich.*

Colorado Bird Notes.—I wish to record the following occurrences in Colorado. While all have been previously recorded from the State they are rare.

Dolichonyx oryzivorus. BOBOLINK.—One on Brush Creek near Eagle, Eagle County, June 5, 1923.

Geococcyx californicus. ROAD-RUNNER.—One along the Cañon City—Colorado Spring highway, near Penrose, Fremont County, June 25, 1923.

Spiza americana. DICKCISSEL.—One eight miles southeast of Fort Collins, Larimer County.—W. L. BURNETT, *Fort Collins, Colo.*

RECENT LITERATURE.

Brewster's 'Birds of the Lake Umbagog Region of Maine.'—One of the treats enjoyed by readers of the earlier volumes of 'The Auk' were the bird biographies that appeared now and then from the pen of the late William Brewster. Written in a clear, straightforward style, with no effort at embellishment, they were yet full of the atmosphere of the haunts he was describing and ever fascinating to the fellow student of the birds whose habits he was recording. When the well known 'Birds of the Cambridge Region' appeared doubtless others beside the writer regretted that the scope of the work necessitated the cutting down of the accounts of the various species to statements of character of occurrence, relative abundance, etc., with little of the charming biography of which the author was capable.

It must therefore be a great delight to us all to realize that before his death Mr. Brewster was able to complete his accounts of the birds of Lake Umbagog, that spot in the wilds of Maine which he so loved to visit, where more than anywhere else he was able to study birds under primeval conditions. And in these accounts which are now being published by the Museum of Comparative Zoology, we find the biographies which we missed in 'The Birds of the Cambridge Region.'

¹ The Birds of the Lake Umbagog Region of Maine. By William Brewster. Bull. Mus. Comp. Zool. [Cambridge, Mass.] Vol. LXVI. Part 1. June, 1924, pp. 1-200. Price post paid \$1.50.

Based on his experiences with the birds of Umbagog during a period of nearly forty years, these biographies consist of admirably written summaries of the habits and occurrence of each species with many detailed descriptions of particular incidents and delightful bits of personal experience and extracts from the author's diaries. As we read the pages we seem to see before us the lake in its setting of mountains and forest primeval, the canoe from which Brewster made many of his observations, his frequent companion, Alva Cooledge, his setter dog "Druid" and the ever-changing ornithological background.

It is these intimate studies of wild birds that constitute the great charm of ornithology and we are doubly indebted to the man who has the ability and patience to record his observations and to pass them on for the delight and instruction of his successors, as Mr. Brewster has done. The scientific value of such records, too, is very great and the importance of that branch of ornithology which pertains to animal behaviour is only beginning to be realized. Along with it is the necessity, in recording our data, of distinguishing clearly between actual observation and inference—a distinction which in Mr. Brewster's writings is scrupulously maintained. The concentration of effort on the study of the bird life of a limited region as has been done in 'The Birds of Umbagog' has always appealed to the writer as far more worth while than the spreading of our studies over a wide area, pleasing as this more varied experience may be, though the intimate and authoritative knowledge that one acquires of a region long subjected to intensive study has a charm and a value that it is hard to overestimate.

The present publication is only the initial part of Mr. Brewster's work and covers, beside the brief introductory pages, only the water birds as far as the Rails.

There are some delightful descriptions of various spots located about the lake with their natural characteristics, some account of the changes of season about the lake and a few pages on migration. In the latter the author reasserts his belief, so clearly set forth in his pamphlet on 'Bird Migration,' that natural landmarks play the most prominent part in guiding birds on their way. He thinks that the importance of Dr. Watson's experiments on Terns at the Dry Tortugas "has been overestimated and its precise significance more or less misinterpreted," and that the return of the Sooty Terns from Hatteras could easily be explained by their following the coast line. This however was written before Dr. Watson's further experiments showing a return flight directly across the Gulf of Mexico from Galveston to the Tortugas, while Mr. Brewster himself admits "that Terns and other sea-frequenting birds must possess a specialized, and for the most part intuitive sense of direction" to enable them to find their way so directly through dense fog. He does not, however, think we are warranted in arguing that land birds have this sense so highly developed, and holds that they are less often guided by it than by conspicuous landmarks and suggests further the possibility that the

sun and moon may frequently serve certain of the more acute and observing species as guides to direction.

We shall look forward to the appearance of the remaining parts of Mr. Brewster's work with keen interest and with the confidence that when completed it will constitute one of our most important publications on the life histories of North American birds.—W. S.

Gyldenstolpe on Birds of Central Africa.—Count Gyldenstolpe, the author of this important report¹ accompanied the Crown Prince of Sweden Expedition to Central Africa and hence is able not only to discuss the systematic relationship of the various species obtained but to comment on their range and habits from personal experience, which adds not a little to the value and interest of his report.

The expedition starting from Nairobi crossed to Lake Victoria, thence to the Birunga volcanoes and the north shore of Lake Kivu. Turning north it visited Lake Edward and the Congo forest north of Beni, thence to Irumu, Lake Albert and out by way of the Nile. The expedition covered the months of January to August, 1921, inclusive.

There are interesting discussions of the avifauna and physical features of several of the regions visited. The author shows that the avifauna of the Birunga Mountains has been derived mostly from an immigration of southern and eastern forms and not from the West Africa fauna as in the case of Mt. Ruwenzori. He endorses Lönnberg's hypothesis that the forest region of tropical Africa was originally of much greater extent and its breaking up into separate areas accounts for the disconnected distribution of various species, or the presence of slightly differentiated races in widely separated localities. With the climatic changes, resulting in great diminution in the rainfall of Eastern and Southern Africa, former forest species were either wiped out or adapted themselves to other environments, forming new species or races.

The annotated list of the species collected or observed occupies most of the report—some 300 pages, and contains very full discussions of their relationship, distribution and nomenclature and in most cases some account of their habits. There is a full list of the specimens, often with measurements and colors of the soft parts, making an exceedingly valuable contribution to the ornithology of Central Africa.

We notice only one new name, *Rhinoploceus* (p. 35), a new subgenus for the interesting Weaver Finch, *Malimbus flavipes*, described by Chapin from the Ituri forest, and of which this expedition obtained two specimens. The new forms secured by the Swedish Expedition were all previously described by the author in the 'Bulletin' of the British Ornithologists' Club.

¹ Zoological Results of the Swedish Expedition to Central Africa, 1921. *Vertebrata I. Birds*. By Nils Gyldenstolpe. With 1 map, 2 plates and 16 figures in the text. Kungl. Svenska Vetensk. Handl. Tredje Serien. Band 1, No. 3, 1924, pp. 1-326.

A good map, two colored plates, several half-tones of scenery and a bibliography complete this excellent report.—W. S.

Nice's 'The Birds of Oklahoma.'—This excellent state list¹ places Oklahoma in the lists of States which have thoroughly up-to-date bird lists and there are today but few States that are not so equipped. The annotated list which makes up most of the work includes 361 species and subspecies of which 96 are residents, 117 summer residents, 49 winter visitants, 83 transients and 16 of casual occurrence. There are also 36 species which may be expected to occur, listed separately. The annotations contain many references to publications and to specimens collected and authoritatively identified. The preliminary chapters according to their headings treat of Faunal Areas, Historical Sketch, Changes in Bird Life, Game Laws of Oklahoma, The Economic Value of Birds, and The Attraction and Protection of Birds. There are also a bibliography, a geological map and several views of characteristic scenery.

While the authors deplore the lack of early records of Oklahoma birds the paucity of publications has its advantages since they are largely relieved of the task which falls to most makers of state lists of correcting or repudiating the work of their predecessors. The casual mention of certain species from within the present boundaries of the State by Long's Expedition, Washington Irving, Abert and Woodhouse are the only publications prior to 1900 although a later list by the late Dr. W. W. Cooke deals with observations made in 1883-1884.

The list is carefully compiled and will be welcomed as a work of reference by all faunal ornithologists while it forms an excellent guide book to the college students and young ornithologists who take up a serious study of the birds of their State.—W. S.

Lincoln's 'Instructions for Banding Birds.'—Bird-banding is now too well understood to require any explanation or defence and we need only say that this excellent pamphlet² by Mr. Lincoln, who is in charge of the bird-banding work of the Biological Survey, furnishes all the instruction and advice that the prospective bird-bander will require, with full descriptions and illustrations of such implements, bands, traps, etc., as are needed in the work. There is also a bibliography of the more important American publications on the subject. It is interesting to note that ten of the nineteen articles listed appeared in 'The Auk.'

¹ The Birds of Oklahoma. By Margaret Morse Nice and Leonard Blaine Nice. University of Oklahoma Bulletin. New Series No. 20, University Studies No. 286, May 15, 1924, pp. 1-122, pls. 1-11.

² Instructions for Banding Birds. By Frederick C. Lincoln, Assistant Biologist, Division of Biological Investigations, Bureau of Biological Survey. U. S. Dept. Agriculture. Miscellaneous Circular No. 18. Washington, D. C., May, 1924, pp. 1-28. Price 10 cents, to be ordered from Supt. of Documents, Govt. Printing Office, Washington, D. C.

In glancing over the pages of Mr. Lincoln's pamphlet one cannot but be struck with the resemblance between the cuts here presented and those illustrating books on bird catching, published before the days of protection. We can never tell what revivals will take place and what methods once branded as nefarious will come into good and honorable use!—W. S.

Murphy on the Results of the Whitney South Sea Expedition.—

While we are informed that the American Museum will in due course publish an appropriate record of this investigation of the avifauna of Polynesia made possible by the generous patronage of Mr. Harry Payne Whitney, it has seemed desirable to publish, at once, lists of the birds so far obtained, and Dr. Murphy has prepared two contributions to this end.¹ The collecting is under the direction of Rollo H. Beck and so far no less than ninety of the South Pacific Islands have been visited, mainly in the Tuamotu, Marquesas, Society, Austral, Cook and Samoan groups.

The first paper deals with Gallinaceous birds and Pigeons and includes accounts of seventeen species. *Thyliphaps* (p. 7) is proposed as a new genus for *Ptilinopus huttoni* of Rapa or Oparo Island, known previously from a single specimen obtained in 1873. *Ptilopus dupetithouarsii viridior* (p. 4) is described as new, from Nukuhiva Island, Marquesas.

The second paper covers Pigeons, Rails and Petrels and we find the new genus *Nesophylax* (p. 5) proposed for *Porzana atra* of Henderson Island. Eight species are here considered.

It seems peculiarly fitting that this investigation should be undertaken by Americans since it was the U. S. Exploring Expedition which first made known many of the forms now being listed by Dr. Murphy and the name of Peale, the ornithologist of that famous expedition, occurs frequently as we turn the pages of these papers.—W. S.

Murphy on the Ornithology of the Cape Verde Islands.—This report² is based primarily upon a collection of 300 skins made in the islands by Mr. Jose G. Correia, in 1922. Besides a well annotated list in which the relationship of the species is considered and data presented on habits, food, etc., with extracts from publications of previous writers, there is a detailed consideration of the geographic relations of the group and of climate and oceanography.

There are 75 species of birds reported from the islands of which 38 are resident and 37 seasonal visitants. Of the first group three are introduced and nine are marine, leaving 26 which can be considered in judging the relationship of the avifauna.

¹ Birds Collected During the Whitney South Sea Expedition. By Robert Cushman Murphy. No. 1, May 29, 1924, Amer. Mus. Novitates, No. 115, pp. 1-11; No. 2, July 22, 1924; *ibid.* No. 124, July 22, 1924.

² The Marine Ornithology of the Cape Verde Islands, with a list of all the Birds of the Archipelago. By Robert Cushman Murphy. Bull. Amer. Mus. Nat. Hist., Vol. L, Art. III, pp. 211-278, July 3, 1924.

Dr. Murphy would group these as follows: Palaearctic Element eight; Ethiopian Element seven and Neutral eleven, and he considers that the bird life can be stamped as belonging to neither region, being distinctly transition in character. Wallace regarded it as Palaearctic and Bannerman and Neumann as Ethiopian, and their arguments are fully discussed.

In his interesting discussion of the distribution of the marine species Dr. Murphy states that "In general, the boundaries of the breeding ranges of tropical sea-birds are fixed by water temperatures rather than by atmospheric temperatures." Thus oceanographic conditions are responsible for the presence of breeding Frigate-birds, Boobies and Tropic-birds on the Cape Verdes and their absence on the Canaries, as well as their range far to the northward on the western side of the Atlantic. This publication is an important contribution to island ornithology especially with regard to marine species.—W. S.

Beck's 'Ornithology of Lancaster Co., Pennsylvania.'—Although including within its boundaries a region quite as interesting ornithologically as that of the adjoining county of Chester, Lancaster County, Pennsylvania, has received in comparison but very meagre attention from bird students. The only county lists with which we are familiar are those of Judge Libhart, published in 1844 and 1869 and the only other contributions to the ornithology of the county are contained in Warren's 'Birds of Pennsylvania' and Stone's 'Birds of Eastern Pennsylvania and New Jersey.' It is therefore a matter for congratulation not only that the county has developed an able local ornithologist in Prof. Beck, of Franklin and Marshall College, but that he has published the results of his studies in the form of a fully up-to-date list of the birds.¹ Like the Libhart lists it forms a chapter in a history of the county, though the author has reprinted the list of birds and mammals in a separate brochure.

The work is carefully compiled and contains much original information. It should serve as a stimulus to bird study in the county and pave the way for a still more exhaustive treatise on the subject. The lower Susquehanna Valley which bounds the western side of Lancaster County is an extremely interesting region and though its flora has been pretty thoroughly studied much remains to be learned of its bird life while the power dam at McCall's Ferry has created a great body of still water which is bound to become a rendezvous for waterfowl, and add materially to the interest of the local bird student.—W. S.

¹ A Chapter on the Ornithology of Lancaster County, Pennsylvania, with Supplementary Notes on the Mammals. By Herbert H. Beck, Executive Curator of the Franklin and Marshall College Museum. Reprinted by Permission of the Copyright Holders, The Lewis Historical Publishing Co., Inc., of New York City, from "Lancaster County, Pennsylvania; A History" 1924. Proof-reading by Witmer Stone, President of the American Ornithologists' Union. Map by Courtesy of the Steinman Hardware Company, pp. 1-39.

Chapman on New South American Birds.—Dr. Chapman's continued studies of the South American avifauna have resulted in two more contributions since our last issue. The first of these¹ contains descriptions of new forms of *Mecocerculus*, *Ochthoeca* (2), *Platytricus* *Poecilotriccus*, *Euscarthmus*, *Spizitornis* (3), *Mionectes*, and *Phaeomyias*,—all belonging to the Tyrannidae and obtained from Colombia, Ecuador and Peru.

The second paper² treats of Tracheophonae and includes two new genera, *Xenornis* (p. 1) for *X. setifrons*, a curious new species obtained at Tacarcuna, eastern Panama, in 1915, but which still remains unique; and *Apocryptornis* (p. 5) for another novelty, *A. lineifrons*, from the Papalacta River, allied to *Grallaria* and *Hylopezus*. There are also new forms described of the genera, *Dysithamnus*, *Melanopareia*, *Chamaeza*, *Synallaxis*, *Cranioleuca*, and *Xiphorhynchus*.—W. S.

Chapman and Griscom on 'The House Wrens of the Genus Troglodytes.'—This paper³ is a model of its kind. Not only is the taxonomic side of the study admirably presented with full descriptions, synonymy and lists of specimens examined, but there is a general discussion of the distribution of the family and of the special group under consideration, with suggestions as to its origin, lines of dispersal, etc. From this we learn that Wrens are probably of American origin with 239 Neotropical forms as against 48 for the Old World; that the House Wren has a wider distribution than any other American Passerine bird; and that it is a "successful" species in its ecological relations, able to hold its own against enemies, to drive out rivals, and to adapt itself to nesting places provided by man. The very "fluidity" of the House Wren group makes it difficult to trace its center of dispersal. It occupies arid and humid areas, "crosses the Andes where they are highest, and seems as much at home in the Paramo Zone as in the tropics."

The authors are compelled to regard the North American House Wrens as differing specifically from the South American group but feel that they will yet be found to intergrade. The four Central American forms including *peninsularis* which occupies the eastern coast region of most of Mexico, are subspecies of *musculus*, the South American type, but owing to the migratory character of the North American type *aëdon*, it is impossible to fix definitely the relation between the two until the breeding range of the latter in Mexico is determined.

Thirteen South American races of *musculus* are recognized together with two forms which are regarded as of specific rank: *T. cobbi*, of the Falkland

¹ Descriptions of New Flycatchers from Colombia, Ecuador and Peru. By Frank M. Chapman. Amer. Mus. Novitates. No. 118, June 20, 1924, pp. 1-11.

² Descriptions of New Genera and Species of Tracheophonae from Panama, Ecuador, Peru and Bolivia. By Frank M. Chapman. Amer. Mus. Novitates. No. 123, July 2, 1924, pp. 1-9.

³ The House Wrens of the Genus Troglodytes. By Frank M. Chapman and Ludlow Griscom. Bull. Amer. Mus. Nat. Hist., Vol. L, Art. IV, pp. 279-304, July 8, 1924.

Islands and *T. tectellatus*, from isolated river valleys in southwestern Peru and northwestern Chile. *T. m. carabayae* (p. 296) allied to *audax*, and found in southeastern Peru is described as new. A number of races described by previous authors are relegated to synonymy.—W. S.

Loyd's 'The Protection of Birds.'—This¹ is a curious publication, being a rather disconnected attack upon the British 'Wild Life Protection Act' and the methods of the Royal Society for the Protection of Birds, by one who is apparently espousing the side of the egg collector. There are always extremists on both sides in discussing bird protective legislation as it affects the collector, but we can see nothing to be gained by such a vehement attack as this and the heat displayed by the author, especially his characterization of a certain statement of the protectionists as "nothing more or less than a — lie" discount to a great extent the weight of his remarks.

Collectors can gain their points better by cool-headed appeals and constructive suggestions than by such vigorous denunciations.—W. S.

Mathews' 'The Birds of Australia.'²—This great work is rapidly approaching completion, and the two additional parts which have appeared since our last notice continue the consideration of the family Melithreptidae. In Part 6 of Volume XI the genera *Ramsayornis*, *Grantiella*, *Lacustroica*, *Conopophila*, *Certhionyx*, *Zanthoniza* and *Glycichaera* are treated, one new form *Conopophila albogularis mimikae* (p. 390) from Mimika River, S. W. New Guinea, being described as new. There are also a number of descriptions of plumages to be added to the accounts of species treated in previous parts.

In Part 7 the genera *Lichmera*, *Ptilotina*, *Microptilotis*, *Paraptilotis*, *Dorothina*, are considered. The method of treatment is the same as in the other recent volumes, the subspecies being all listed in the synonymy whether accepted or not, with an elaborate history of their nomenclature, etc., in the text.—W. S.

Dr. Lowe on the Presence of Broadbills in Africa.—In 'The Ibis' for 1914, Mr. G. L. Bates, the well-known ornithologist resident in Cameroon, made the interesting announcement that the African genus *Smithornis* hitherto regarded as a Flycatcher possessed characters which showed clearly that it could no longer be retained in the Muscipidae, if indeed it could be regarded as a normal Passerine bird. Although he did not make a definite statement, it was obvious that he considered that the genus might better be grouped with the Oriental Broadbills, Eurylaemidae, a family unknown from Africa.

¹ The Protection of Birds: An Indictment. By Lewis R. W. Loyd. Longmans, and Co., 39 Paternoster Row, London, E. C. 4; New York, Toronto, Bombay, Calcutta and Madras. 1924, pp. 1-vi + 1-88. Price \$1.25 net.

² The Birds of Australia. By George M. Mathews. Vol. XI, Part 6, pp. 361-416, pls. 9. June 21, 1924. Part 7, pp. 417-472, pls. 6. July 31, 1924.

Now Dr. Lowe,¹ with fresh material, brought from Cameroon on Mr. Bates' latest visit to England, confirms his suspicions and shows conclusively that *Smithornis* is a Broadbill. He also suggests that Rothschild's unique *Pseudocalyptomena graueri* from the bamboo forests north of Lake Tanganyika may also "actually be a Broadbill instead of merely reminiscent of one." Incidentally Dr. Lowe calls attention to the long white-based feathers which overlie the *pteryla spinalis* in *Smithornis* and which are exactly like those found in Oriental *Eurylaemidae* and says "it seems evident that colour pattern in this, as in so many other examples which could be quoted, has a deep seated origin, pointing to similar chromosomal factors and phylogenetic affinities." This is a point which the reviewer has long claimed.—W. S.

Mitchell on the Birds of Saskatchewan.—The Saskatchewan Department of Agriculture has reprinted the account of the birds² of the province by H. Hedley Mitchell which appeared as a special number of the 'Canadian Field Naturalist.' It consists of a brief historical and topographical introduction and an annotated list. Six half-tones and a colored faunal map illustrate this excellent publication which will serve to spread interest in the ornithology of the province. The author has added in manuscript three species reported since the publication of the list: Knot, Hudsonian Curlew and Crested Flycatcher.—W. S.

Hatt on Land Vertebrate Communities of Western Leelanau County, Mich.—This paper³ consists of lists of species of vertebrates characteristic of twenty-five different habitats. The value of such minute ecological classification is open to question as it is difficult to correlate the habitats with those of another region, even close by, and many of the associations are self evident. However Mr. Hatt's work is well and carefully done and the criticism is directed to this type of investigation, not to his application of it. An annotated list of the mammals follows which will be of distinct value in working out the more general distribution of the species.—W. S.

Collinge on the Food and Feeding Habits of the Blackbird.⁴—Dr. W. E. Collinge in another of his useful papers on the economics of British birds treats the Blackbird, that homologue of our Robin, and it proves

¹ On the Presence of Broadbills (*Eurylaemidae*) in Africa. By Percy R. Lowe. Proc. Zool. Soc. London, 1924, pp. 279-291. March 31, 1924.

² Catalogue of the Birds of Saskatchewan. By H. Hedley Mitchell. Govt. of the Prov. of Saskatchewan, Dept. of Agriculture. Regina, May, 1924. Reprinted from the 'Canadian Field Naturalist,' Vol. XXXVIII, No. 6. Special number, May, 1924, pp. 101-118.

³ The Land Vertebrate Communities of Western Leelanau County, Michigan, with an annotated list of the Mammals of the County. By Robert Torrens Hatt. Reprinted from the 'Papers of the Michigan Academy of Sciences, Arts and Letters,' Vol. III, 1923, pp. 369-402, pls. XXIV-XXVI.

⁴ Journ. Ministry Agr., 31, No. 2, May, 1924, reprint 5 pp.

that the relationship of the species involves food habits as well as structure. A fourth of the food of resident Blackbirds consists of cultivated fruits (strawberries, raspberries, gooseberries, currants, plums, and even apples and pears), and 61 per cent in all of the diet is vegetable. The 39 per cent of animal food is subdivided as follows by Dr. Collinge: injurious insects, 22 per cent; beneficial insects, 3.5 per cent; neutral insects, 5.5 per cent; slugs and snails, 2.5 per cent; and miscellaneous, 1.5 per cent. Grouping the birds according to the place of collection, whether in fruit-growing or urban districts, shows that fruit is consumed much more heavily where easily available, the ratio being 28.5 per cent to 18.5 per cent for these districts in the order mentioned. The birds from fruit-growing localities consume only 32 per cent of animal food compared to 45.5 per cent for those from urban areas. Dr. Collinge concludes as follows:

"Investigations conducted in this and other countries on different species of wild birds suggest that this is precisely what we should expect. Over and over again it has been pointed out that a bird feeds upon the food that is the most easily obtained, and that the reason why a species becomes injurious is that we have too many of that species feeding upon the same kind of food.

"It does not seem necessary to enter into any further analysis of the figures obtained, for it is doubtless patent to every unprejudiced mind that at the present time we have too large a resident population of Blackbirds—which is from time to time augmented by immigrants. The struggle for existence must be very keen, and so long as these conditions obtain in fruit-growing districts, the Blackbird will continue to be one of the most destructive birds with which the fruit-grower has to contend. Before it can be regarded as a neutral or a beneficial factor its numbers will have to undergo considerable diminution."—W. L. M.

Birds in Insect Control.—It is gratifying to find a work on Economic Entomology in which a chapter is devoted to birds. The reviewer does not recall a previous instance but we now have one in a book entitled 'The Principles of Insect Control,' by Robert A. Wardle of the University of Manchester, and Philip Buckle of the University of Durham (Manchester Univ. Press, 1923, 295 pp.) in which Chap. V, pp. 57-70 and pp. 259-260 of the bibliography relate to Bird Encouragement. These sections being strictly compiled are rather uneven in treatment of various phases of the subject, and of work on economic ornithology in different countries. However, a stand is made for abundance of material, well distributed seasonally, and geographically as an essential to the proper economic study of a bird. In summing up the practical relations of British birds the statement is made that "the cuckoos, swifts, lapwings, woodpeckers, and the majority of Passerine birds, particularly Paridae (tits), Turdidae (thrushes), Muscicapidae (flycatchers), and Hirundinidae (swallows), are of the utmost value." (p. 61). The reviewer would seriously object to only one sentence in the entire chapter, and that is one which ranks

among important causes of the destruction of birds "the attentions of that trio of self-styled bird lovers, the gamekeeper, the bird catcher, and the ornithologist." Surely this derogatory classification of ornithologists is unjustified in Great Britain as we know it would be in this country. Most ornithologists are true bird lovers, and their collecting of specimens, on the whole, is considerably regulated. Moreover, it should not be forgotten that it is only because of collecting, and the labors of ornithologists that the facts of economic ornithology were brought to light, and that it is upon these that the whole structure of bird protection rests.—W. L. M.

Birds in Relation to the Foot-and-Mouth Disease of Cattle.—The recent outbreak of foot-and-mouth disease in California, although quickly put under control and prevented from spreading, caused excitement throughout the far western states. Since cattle-raising is one of the most important industries of the region apprehension among the people was no more than was to be expected. Numerous proposals for curbing the disease, however, were based on speculation only and among them were some affecting birds. At the original center of the outbreak a demand arose for a general poisoning campaign against Blackbirds and certain other species which were thought capable of distributing the disease. In Arizona, it was proposed to establish a guard near the California line, one of the duties of which would be to shoot all Buzzards and other carrion-feeders attempting to come across. Washington appealed for an open season on "pigeons, crows, and other scavenger birds" that might carry the disease to that State in migration, and so on.

Before action was taken on any of these suggestions, however, cooler counsel prevailed and no campaigns against birds, of any great extent at least, materialized. Investigation by representatives of the Biological Survey and others in the heart of the infected district yielded no positive evidence that wild birds distribute the disease. This has been the net result of previous investigations also and until we know definitely what rôle birds play in relation to the disease, clamor for bird destruction based on insufficient knowledge will recur. We are informed by Dr. J. R. Mohler, Chief of the Federal Bureau of Animal Industry, that in the general outbreak of 1914, when 22 states and the District of Columbia were infected by the disease, considerable time was given to tracing out its various sources of infection, and that at that time among the birds the Crow seemed to have been the chief suspected carrier and that "a careful study of its habits by a number of inspectors brought out some interesting facts in this connection. In one instance a flock of crows was followed by telephone and automobile for a distance of 35 miles. The habits of these birds in flying from place to place, alighting in cattle and hog yards and running over the ground, picking up small bits of manure or litter upon their feet, showed that they may become carriers of such an intensely infectious disease. However, in the 3,556 herds infected in 1914, the birds (and crows particularly) were incriminated in only a few cases, as follows:

Iowa 3, Kansas 2, Michigan 1, New York 3, Ohio 2, Pennsylvania 3, Wisconsin 4."

Incriminated in this case means suspected, for to this day there has been no adequate investigation of the means of spread of foot-and-mouth disease, and statements as to their identity and importance reflect opinion more than anything else. The inadequacy of the ordinary observational approach to this problem is shown by a recent English paper¹ on the subject. The authors, one a distinguished veterinarian and the other experienced in ornithology, conclude that "There would appear to be most remarkable relations, both as regards seasons and localities between the movements of birds and the initial outbreaks of invasion in foot-and-mouth disease in Great Britain" (p. 693).

However, Mr. A. Landsborough Thomson, an eminent British naturalist, after a careful examination of the data upon which this dictum is based does not consider² the correspondence between the two sets of phenomena, when examined in detail, so remarkable as the authors contend, and here the reviewer, upon inspection of the maps and other information given, certainly shares this opinion.

The most striking thing about the whole subject of the relations of birds to the foot-and-mouth disease is the lack of definite evidence. From the standpoint of cure of the malady as well as of preventing its spread, rigidly controlled experimental investigation of possible carriers would seem most desirable. When the relation of the tick to Texas fever of cattle was discovered, the way was opened for control and extirpation of that pest of southern livestock. Similarly, when the rôle of the yellow-fever mosquito became known that disease lost its terrors. Until adequate investigation of alleged bird carriers of the foot-and-mouth disease is made, at every recurring outbreak we shall be in the same position of uncertainty as now, and the hysteria of the public will continue to be matched by the ignorance of scientists. Mr. Thomson strikes a hopeful note in his final sentences when he says that "Sir Stewart Stockman is now experimentally investigating the possibility of the infection being carried by birds. The question remains open, and further research may well be useful." He then concludes as to birds carrying the disease (and it would seem that the conclusion is applicable in the United States as in England), that the "evidence put before us does very little towards establishing a *prima facie* positive case."—W. L. M.

Economic Ornithology in Recent Entomological Publications.—

As the results of research accumulate it becomes more and more evident that practically all insect pests have their bird enemies. Intensive study

¹ Stockman, S., and Marjory Barnett. Bird Migration and the Introduction of Foot-and-Mouth Disease. Journ. Ministry Agr. (London), 30, No. 8, Nov., 1923, pp. 681-695, 6 maps.

² Bird Migration in Relation to Foot-and-Mouth Disease. Nature, 113, pp 52-54, Jan. 12, 1924.

brings out the fact also that in many cases birds are a large if not the largest single factor in natural control. All such information is certainly good for the cause of bird protection and the reviewer hopes to bring installments of it to the attention of ornithologists as frequently as practicable.

False wireworm (*Eleodes suturalis*).—In connection with an account of the biology of this insect, which is a serious menace to the production of wheat and other small grains in the Middle West, Messrs. Wade and St. George note that various species of birds feed upon beetles of the same genus (others of which also are injurious) and that probably this particular species is eaten.¹ A list is given of 13 kinds of birds that have been found by the Biological Survey to feed upon beetles of the genus *Eleodes*.

Argus tortoise beetle (*Chelymorphism cassidea*).—This insect feeds upon the foliage of sweet potatoes. It is red or yellow with black spots, typically warning coloration and belongs to one of the supposedly specially protected families (Chrysomelidae) of insects. Yet according to the author of a recent paper² on the beetle, "The Biological Survey has found the Argus tortoise beetle in the stomachs of 14 species of birds, most often in those of the starling (*Sturnus vulgaris*) and kingbird (*Tyrannus tyrannus*)."

Codling moth (*Carpocapsa pomonella*).—This is the worst pest of the apple, and birds are its most important natural enemies.³ A recent regional study adds to knowledge of the value of birds, as it was found in Arkansas, that "Probably by far the most important natural enemies of the codling moth in this region are woodpeckers, particularly the red-bellied woodpecker. This species is abundant locally, and in some orchards which adjoin woodlots the majority of cocoons of the codling moth are apparently opened by this bird."⁴

Oak sapling borer (*Goes tessellatus*).—"No insects predacious or parasitic upon the oak sapling borer have been discovered. Woodpeckers destroy many of the larvae and pupae by drilling through the wood and removing them from their burrows. The species of bird responsible for the destruction of the borers was not determined, but the marks made in removing the insects were noticed frequently in woods where both the hairy woodpecker, *Dryobates villosus* (L.), and the downy woodpecker, *Dryobates pubescens medianus* (Swains.), were abundant."⁵

Larch sawfly (*Lygaeonematus crichsonii*).—The ever-interesting notes on natural control by Acadian workers supply the data quoted relative to this and the subsequently mentioned insect pests. The larch sawfly periodically ravages the stands of its food plant in southern Canada and the northern United States, the outbreaks usually ending only when a

¹ Journ. Agr. Research, 26, No. 11, Dec. 15, 1923, p. 562.

² Chittenden, F. H. Journ. Agr. Research, 27, No. 1, Jan., 1924, p. 50.

³ See McAtee, W. L. Yearbook, U. S. Dept. Agr. (1911) 1912, pp. 237-246.

⁴ Isely, D., and Ackerman, A. J. Life history of the codling moth in Arkansas. Bull. 189, Ark. Agr. Exp. Sta., Dec., 1923, p. 48.

⁵ Brooks, Fred E. Oak Sapling Borer, Journal of Agricultural Research, Vol. XXVI, No. 7, Nov. 17, 1923, pp. 317.

high percentage of the trees have been killed. In the course of a recent infestation in New Brunswick, Mr. A. B. Baird observed Vesper and Song Sparrows, the Palm Warbler, and Black-capped Chickadee feeding on the larvae, and gives birds credit¹ for consuming about 10 per cent of them. "The work of birds was much more noticeable on the edges of clearing and in old pastures than in the more typical tamarack swamps."

Larch case-bearer (*Coleophora laricella*).—While this insect is not such a scourge as the larch sawfly, it kills some of the trees and is an ever-present drain on their vitality. Regarding it Mr. Baird says:² "Birds were among the chief factors in controlling this insect and the following species were noted: Song Sparrow, Chipping Sparrow, unidentified sparrow, Mourning Warbler, American Goldfinch. On May 18th in the woods at Fredericton large numbers of birds were seen feeding on the larvae; Song Sparrows and Chipping Sparrows were the most abundant. A large species of sparrow, which was not identified, was also present, and a few Mourning Warblers. These birds were all feeding very eagerly upon the case bearers and the snap of their bills was very noticeable on all sides as they hopped from branch to branch picking off the larvae. One Song Sparrow was seen with its beak packed with case bearers but all the others appeared to swallow them as they picked them from the trees. On May 20th, in the same place, birds were again noted feeding voraciously on the larvae, Chipping Sparrows being the most abundant species. In this particular area a very large percentage of the larvae had been eaten and on trees where there were from 2 to 5 or more case bearers in each leaf whorl on May 10th, one could not find more than one case bearer in every 2 to 5 leaf whorls on the 18th. Birds were also seen feeding on the larvae at Chipman but not to the same extent and it is doubtful whether the birds were so abundant in most of the larger larch swamps; they were noticeably much more abundant around the edges of clearings and old pastures. The percentage taken in these places probably amounted to 75 per cent at least but in general about 25 per cent would probably be nearer the average."

Spruce budworm (*Tortrix fumiferana*).—Outbreaks of the spruce budworm of increasing frequency and seriousness culminated in one in which practically all fir of commercial size in New Brunswick was killed and red spruce seriously damaged. Dr. J. D. Tothill who carefully studied the progress of the latest infestation observed³ that "Even in the most heavily infested parts of New Brunswick it soon became evident that there were natural checks operating against the budworm that sooner or later would bring it under control." At Fredericton in 1918 about 20 of the average laying of 150 eggs were eaten by birds. Together the various natural checks cut the numerical abundance in half. "In succeeding years, as

¹ Proc. Acadian Ent. Soc. 8, (1922) 1923, p. 162.

² l. c. pp. 169-170.

³ Op. cit. pp. 174-176.

the food pressure increased and the insects decreased, the birds and insect parasites became more important. The birds observed feeding on the larvae were: The White-throated Sparrow, the Song Sparrow, the Junco, the Robin, the Black and White Warbler, and several undetermined species of Warblers. . . . The outstanding fact concerning these natural checks is that at all places, such as Fredericton, where the favored food plant was present in abnormally large quantities, the natural checks were wholly incapable of suppressing the insect until it became practically starved out of existence.

"In marked contrast to the Fredericton conditions were those in Madawaska County and at Lillooet in British Columbia, where the favored food plants—balsam fir and Douglas fir, respectively—existed in smaller and more natural quantities." At Lillooet it was found that of the eggs and pupae resulting from an average clutch of 150, fifty-eight were consumed by birds. "In this case," says Dr. Tothill, "the natural checks brought about a reduction of the insect before any trees were killed and in the following year the outbreak subsided entirely, due to continued activity of the birds against the smaller number of larvae. Juncos were by far the most abundant of the birds, but others were,—Mountain Chickadee, Western Tree Sparrow, Western Robin, Western Tanager, Hermit Thrush, Western Evening Grosbeak, Bush-Tit, Pygmy Nuthatch, Red-breasted Nuthatch, Black Phoebe, and Brewer Sparrow."

Ornithologists should certainly appreciate the definite and interesting results Dr. Tothill and his associates are publishing on the part birds play in the natural control of insect pests.—W. L. M.

The Ornithological Journals.

Bird-Lore. XXVI, No. 3. May-June, 1924.

Feathered Friends about my Door. By Mrs. Glen Eaton-Hodson.—On May 29, thirty-three species could be heard from the writer's door at Anoka, Minn.

Hiking with a Pitch-Pipe. By W. B. Olds.—An admirable lesson in analyzing and comparing bird songs.

History of Four Young Birds. By Rose L. Cannon, and others.—Crow, Rosebreast, Cedarbird and Robin.

Our Winter Guest. By Mary C. Rhoads.—A Carolina Wren occupying a green-house as sleeping quarters.

The educational leaflet treats of the Starling and is by E. H. Forbush with a colored plate by Brooks. There are a number of excellent half-tones illustrating various birds scattered through the number.

Bird-Lore. XXVI, No. 4. July-August, 1924.

Birds and Man. By F. M. Chapman.—An address before the National Conference on Recreation at Washington, D. C., May 22, 1924. It would

be difficult to find as complete and concise a presentation of the subject in all our literature and we congratulate the writer on the admirable quality of what he has himself termed "a fifteen minute cross section through ornithology."

The Rewards of Bird-Banding. By John A. Gillespie.—Observations on various species.

On the Migration Habits of the Starling. By H. E. Ewing.—Discusses the habit of Starlings to associate with Grackles and other birds.

Meal-Time in the Dogwoods. By Mrs. H. J. Taylor.—Lists of species found feeding and the hours.

The Migration Series treats of the Broad-billed, Rivoli and Blue-throated Hummingbirds with a colored plate by Fuertes.

Birds' Nests and How to Find Them. By A. A. Allen.—Is an excellent illustrated paper in the School Department and T. Gilbert Pearson's *Campaigning in Panama and Cuba* is an interesting contribution to the Audubon Executive Department.

The Condor. XXVI, No. 3. May-June, 1924.

Animal Aggregations; A Reply. By Althea R. Sherman.—Presents evidence that the family ties do not necessarily persist when flocks are formed.

Banding Notes on the Migration of the Pintail. By F. C. Lincoln.

Occurrence and Behavior of Certain Shorebirds in Southern California. By Roland C. Ross.

The Status of the Florida Gallinule of Western North America. By D. R. Dickey and A. J. Van Rossem.—Measurements of specimens from the isolated colonies in California and Lower California show that they differ so slightly from eastern birds as to be inseparable.

On the Revealing and Concealing Coloration of Birds: An Unpublished Letter by Theodore Roosevelt.

A List of the Land Birds of the Grass Valley District, California. By E. B. Richards.

The preparation of bird skins on stick handles for class use is described by Dr. Grinnel but he has apparently overlooked the fact that the same method was advocated for the same purpose some years ago by Dr. R. M. Strong in 'The Auk.'

The Condor. XXVI, No. 4. July-August, 1924.

The Starling Family at Home and Abroad. By Casey A. Wood.—A very careful discussion of the life and economic value of the Common Starling and the Chinese Crested Starling which has been introduced about Vancouver. The author's conclusions are that both will become serious nuisances especially in driving away and supplanting native species and that steps should be taken at once to check the increase of the latter species before it becomes too late.

Banding White Pelicans. By Henry B. Ward.

Vigor, Distribution and Pigmentation of the Egg. By Charles K. Averill.

The Common Loon in Alberta. By A. D. Henderson.

Weights of About Three Thousand Eggs. By W. C. Hanna.—Average maximum and minimum weight given for a number of species. Here is an item well worth preserving but which most "oölogists" discard.

The Wilson Bulletin. XXXVI, No. 2. June, 1924.

The New Brown Pelican Rookery on the Florida Coast. By R. J. Longstreet.

Migration Notes from State College, Center Co., Pa. By Thos. D. Burleigh.

There is an anonymous article on the 'Philosophy of Birds' Nests.'

The Oölogist. XLI, No. 5. May, 1924.

Kentucky Warbler. By G. G. Reeves.—Nesting in North Carolina.

The Other Egg in the Nest. By J. Warren Jacobs.—Data on 234 nests containing Cowbirds' eggs in southwestern Pennsylvania.

The Ibis. (11th Series) VI, No. 3. July, 1924.

On the Birds of North and Central Darfur. By H. Lynes.—This first installment is largely descriptive and ecological, with many illustrations of scenery.

Notes on the Birds of Minorca. By P. W. Munn.

On the Type Locality of Certain Birds Described by Vigors. By C. B. Ticehurst.—As the birds described by Vigors (P. Z. S. 1830-31) formed one collection the widely separated type localities which have been suggested for them cannot be maintained and on evidence here presented the Simla-Almora region, eastern Himalaya is proposed. Incidentally *Dryobates hyperythrus sikkimensis* (p. 473) Sikkim, is described as new.

The Affinities of Some Nearctic and Palaearctic Ducks. By Allan Brooks.—Shows that the Pochard and Redhead are not con-specific and that the latter is really nearer to the Canvasback and that the Ringneck is really more nearly allied to the Redhead than the latter is to the Pochard. The separate genera for the Canvasback and Ringneck are considered futile.

Notes on the Hoatzin in British Guiana. By M. D. Haviland.

Notes from Spitzbergen, 1923. By T. G. Longstaff.

The Birds of Sind. Part VIII. By C. B. Ticehurst.—Concluded.

On the Birds Collected in North-western and Northern Cameroon and parts of Northern Nigeria. Part III. By D. A. Bannerman and George L. Bates.

Bulletin of the British Ornithologists' Club. CCLXXXVIII. June 3, 1924.

Mr. Jourdain discusses the Brant and would recognize two forms, the dark breasted *Branta bernicla bernicla* from western Siberia and the light

breasted *B. b. collaris* C. L. Brehm formerly *glaucoaster* of our 'Check-List' of north eastern America. *B. nigricans* of western North America he would regard also as a subspecies of *B. bernicla*.

M. Hachisuka describes *Alaemon alaudipes omdurmanensis* (p. 86) from Sudan.

Bulletin British Ornithologists' Club. CCLXXXIX. July 7, 1924.

Mr. W. L. Selater proposes *Artamella* (p. 91) for *Artamia* preoccupied with *Lanius viridis* (Mull) as type, and describes *Sigmodus scopifrons kirki* (p. 92) as new from Lamu, Kenya. There is much discussion on the validity of the recently described Irish Sparrow Hawk which seems to have been based on an abnormal individual.

Mr. D. A. Bannerman describes *Buccanodon duchaillui gabriellae* (p. 100) French Congo and *Tricholaema hirsutum chapini* (p. 101) River Uelle.

Mr. N. B. Kinnear describes *Tephrodornis pelvica verneyi* (p. 102) Siam and *Garrulax pectoralis subfusa* (p. 103) Tenasserim and Dr. Ticehurst, *Grammatoptila striata sikkimensis* (p. 104) Sikkim.

British Birds. XVIII, No. 1. June, 1924.

The Turtle-Dove in Glamorganshire. Some Breeding Notes. By G. C. S. Ingram and H. M. Salmon.—Illustrated by excellent photographic reproductions.

Migrants at the Reading Sewage Farm. By N. H. Joy.

A Practical Method of Recording Bird-Calls. By Wm. Rowan.—Another graphic method.

British Birds. XVIII, No. 2. July, 1924.

The Migrations of the Herring-Gull and the Lesser Black-backed Gull. Results of the Marking Method. By A. Landsborough Thomson.—The former is practically non-migratory so far as native north Scotland birds are concerned, very few going beyond the limits of the British Isles. The latter is regularly migratory to the Atlantic seaboard of Spain, Portugal and West Africa, birds native to the north of England going by way of France.

Courting Display of the Fulmar. By Henry Boase.

The Light and Dark-breasted Brent Geese. By F. C. R. Jourdain.—A résumé of the communication mentioned above.

The Avicultural Magazine. (Fourth Series) II, No. 5. May, 1924.

Bird Life on the Lake of Geneva. By Alice Hutchinson.

The Avicultural Magazine. (Fourth Series) II, No. 6. June, 1924.

Variations of Hunting by Kestrels. By F. D. Welch.

In Mr. A. G. Butler's discussion of the 'Typical Finches' he considers it a puzzle why the American *Zonotrichias* should be called "sparrows" but it is a still greater puzzle why he should persist in calling them "song-sparrows" which name belongs to quite another group of birds.

The Emu. XXIV, Part 1. July, 1924.

Notes on the Golden-shouldered and Hooded Parrots. By A. S. LeSouef and J. R. Kinghorn.

The Way of an Eagle. By D. W. Gaukrodger.—A parallel study to that of Prof. Herrick treating of the Wedge-tailed Eagle (*Uroaetus audax*) instead of the Bald-headed Eagle. Some of the photographs are remarkably similar.

A Spring Excursion into South-Western Queensland. By Dr. W. Macgillivray.

Seeking Rare Parrots. By A. H. Chisholm.—*Pezoporus wallicus* and

The Ground Parrot in Eastern New South Wales. By J. F. H. Gogerley.

Notes on the Ground Parrot. By H. V. Edwards.

Discovery of the Breeding Place of Buller's Shearwater. Poor Knights Island, N. Z. By R. A. Falla.

A Review of the Genus *Calamanthus*. By Edwin Ashby.

A Trip to Mungeranie, Central Australia. By Dr. Brooke Nichols.

Rediscovery of the White-backed Wren, *Malurus leuconotus* Gould.

By J. R. Kinghorn and Tom Iredale.

Birds Seen Along the West Coast to the Franz Josef Glacier, New Zealand. By P. Moncrieff.

Nest and Egg of the Gang-gang Cockatoo. By F. Howe.

The Oölogists' Record. IV, No. 2. June, 1924.

The American Duck Hawk. By K. A. Pember.—Description of a series of sets of eggs.

The Puffin. By Vivian Hewitt.—Account of the bird on Priestholm Island.

Notes on Eggs from Nyasaland. Anon.

The South Australian Ornithologist. VII, Part 6. April, 1924.

The Birds of the Encounter Bay District. By J. B. Cleland.

Notes on Birds Met With at Gosford and Port Stephens, in New South Wales. By Edwin Ashby.

Birds Noted on a Trip to Cowell and the Hundred of Mangalo. By W. W. Weidenbach.

Revue Francaise d'Ornithologie. 16, No. 181. May, 1924. [In French.]

Ornithological Trips to the Region North of the Sahara. By H. deBalsac.—Constitutes the greater part of this and the two following numbers. There are many measurements of eggs and field notes of interest on the various species listed.

Le Gerfaut. 14, No. 1-2. 1924. [In French.]

On the capture of *Emberiza icterica* in Belgium. By G. van Havre.

Summary of Nidological Researches made in the Region of Bouillon, Luxembourg. By A. Galasse.

L'Oiseau. V, No. 3. March, 1924. [In French.]

The Honey-eaters. By J. Delacour.

Hypolais and Hypolais. By H. Jouard.—Accounts of *H. polyglotta* and *H. icterina*.

L'Oiseau. V, No. 4. April, 1924. [In French.]

The Creepers, Nuthatches and Kinglets. By J. Delacour and M. Legendre.

The Titmice. By M. Legendre.

The Shrikes. By J. Delacour and M. Legendre.

The Prionopids, Swallow Shrikes, Waxwings and Vireos. By J. Delacour.

Notes on the Ornithology of Asia. By J. Delacour.

Ardea. XIII, No. 1. May, 1924. [In Dutch.]

Ornithological Observations in Holland, 1908-1923. By G. J. Van Oordt.

Journal für Ornithologie. 72, No. 3. July, 1924. [In German.]

On the Floristic-Faunistic Associations of South China with Especial Consideration of the Avifauna. By R. Mell.

Inheritance in Canary Birds. By H. Duncker.—An interesting study in genetics.

The Results of my Second Expedition to Mallorca. By Dr. A. v. Jordans. Part II.—Contains descriptions of eight new subspecies of familiar European birds. (To be continued.)

The Swift (*Apus apus*) in the Summer of 1923 at Lubeck. By W. Hagen.

Mutation Studies. By E. Stresemann.—*Phyllastrephus clamans*, *Melanerpes rubrifrons*, and *Scopelus brunneiceps*.

Contributions to the Ornithology of German New Guinea. By E. Stresemann.

Accipitrine Studies. By E. Stresemann.—*Spizaetus ornatus* and *S. tyrannus*; *S. nipalensis* and *S. cirrhatus*; *Hieraaetus pennatus*; the American Accipiter forms, *A. velox* becomes a subspecies of *A. nisus* and *A. cooperi* of *A. bicolor*; *Falco deiroleucus* and *F. albigularis*; *Buteo hypospodius* and *B. poecilochrous*, *Astur meyerianus* and *A. planes*, *Accipiter fasciatus* and *A. novae-hollandiae*.

New Species from North-east Brazil. By E. Snethlage. *Sclerurus caudacutus cearensis* (p. 446) Ceara; *Grallaria martinsi* (p. 447) Ceara; *Picumnus limae* (p. 448) Ceara; *P. pallidus* (p. 449) Quatipuru.

Obituary of Victor Ritter Tschusi zu Schmidhoffen. By J. Gengler.

Ornithologische Monatsberichte. 32, No. 3. May-June, 1924.

[In German.]

Oceanodroma hornbyi from a Chilean Saltpeter Field. By E. Stresemann.—A mummy found.

Puffinus griseus Breeding in the north Chilean Pampa. By E. Stresemann.

New Forms from West Africa. By H. Grote.—*Remiz parvulus senegal*.

ensis (p. 68) Senegal; *Lanius mackinnoni zenkerianus* (p. 69) South Cameroon; *Andropadus ansorgei muniensis* (p. 70) Spanish Guinea; *Hirundo griseopyga gertrudis* (p. 72) Adamaua.

Stresemann describes (p. 81) *Luscinia brunnea dendrobiastes* from Szetschwan.

Ornithologische Monatsberichte. 32, No. 4. July-August, 1924. [In German.]

Stresemann describes *Hieraaëtus kieneri formosus* (p. 108) North Celebes; and *Accipiter minullus sassii* (p. 109) Beni north of Lake Albert Edward.

Der Ornithologische Beobachter. XXI, No. 8, May, 1924. [In German.]

The Appearance in Flight of *Aquila chrysaëtos*. With a plate.

Ornithological Observations on the Region of the Bosphorus. By A. Mathey-Dupraz.

Tori. IV, No. 16-17, June, 1924. [In Japanese.]

Birds from the Eastern Part of the Province of Suruga. By Y. Yamashina.

On Birds from Johore, Malay Peninsula. By N. Takatsukasa and K. Hasunuma.

A List of Birds in the Collection of the Science College Museum. By N. Kuroda.

How can the Sex of Carrier Pigeons be Decided even in Young. By I. Iwata.

On the Breeding of the Indian Broadbills at Kiso, Hondo. I. Sawahara.

A List of the Birds Collected on Hachijojima in the Seven Islands of Izu, Japan. By T. Momiyama.

The Identification of the Chinese Phoenix. By M. Hachisuka.

Ornithological Articles in Other Journals.

Stewart, Walter. Roosting Habits of Lanarkshire Rooks. (Scottish Naturalist, May-June, 1924.)

Nash, J. Kirke. Observations on the Swift. (Ibid.)

Chapin, James P. Profiteers of the Busy Bee. (Natural History, May-June, 1924.)—An interesting account of the life history of the African Honey Guides.

Fogg, P. M. The World Champion Dancing Bird. (American Forests and Forest Life, May, 1924.)—An account of the Albatrosses of Laysan Island, with many illustrations.

Briscoe, Avalon. Red-headed Cops of the Woods. (Ibid. August, 1924.)—Value of Woodpeckers.

Tate, R. C. Some Birds of the Oklahoma Panhandle. (Univ. of Oklahoma, Bull. No. 271, October, 1923.)—A briefly annotated list.

Nice, Margaret M. Nesting Records from 1920-1922 from Norman, Oklahoma. (Ibid.)—Data on 612 nests showing 118 successes and 150 failures.

CORRESPONDENCE.

Photoperiodism in Bird Migration.

Editor of 'The Auk':

No doubt very many of your readers have shared my interest in Mr. Eifrig's discussion of the question "Is Photoperiodism a Factor in the Migration of Birds" (Auk, 1924, XLI, 439). The idea that the seasonal variations in the length of daylight may act as a stimulus to migration has often been put forward, but a further exposition of it is welcome. Ornithologists must be grateful to Mr. Eifrig for drawing their attention to recent botanical evidence as to "photoperiodism" and to the possible existence of an analogy in the case of birds. At the same time they will be cautious about arguing from analogy alone, and will realize that in the absence of more direct evidence the theory as applied to avian migration is purely speculative.

If I may venture a friendly criticism, it is that Mr. Eifrig tends to obscure an important distinction when, for example, he speaks of "compelling" and "controlling," or of "driving" and "regulating," as if they almost necessarily went together. Surely it is essential to distinguish between ultimate causes and immediate stimuli? I may perhaps be allowed to state this point more fully.

In the first place it is desirable to notice that the migration habit obviously serves certain ends which are of advantage to its possessors. In very general terms these are the exploitation of the summer opportunities of high latitude on the one hand, and the avoidance of their winter rigours on the other. But the mere existence of these advantages could neither have originated migration as a habit nor create migration afresh each year: the end does not cause the means, and a thing does not happen simply because it is advantageous. The advantages may well, however, give the habit a "survival value."

This preliminary assumption being granted, the question of actual causation seems to have a dual aspect. The ultimate cause of migration must surely lie in the existence of the inborn habit and in the nature of the forces in the far past which gave it origin. In the second place there must be immediate stimuli, periodically recurring, which evoke the habit to active expression each autumn and each spring. We may liken the habit to an explosive charge in a cartridge, the ultimate cause to the hand

which packed the charge, and the immediate stimulus to the finger which pulls the trigger and so releases the pent-up force. The simile then breaks down, for the habit is not spent as is the cartridge at discharge. But the point is that the pressure of the trigger is a releasing stimulus, a mere "occasional cause" which regulates or controls the action but is not in itself the compelling, driving force.

Securing the maximum amount of daylight throughout the year may be, and probably is, an advantage of the migration habit, but that is not directly a question of causation. Variations in the length of daylight may possibly have been concerned in the origin and the evolution of the habit, but that is a matter necessarily of conjecture only. Photoperiodism may be a (or the) immediate stimulating factor, and it is towards that conclusion, rather than towards any more fundamental theory of causation, that Mr. Eifrig's argument tends.

Even when narrowed down to this aspect of the matter, there are great difficulties in the way of wholly accepting the theory, as there are in the case of all theories on the subject which stress a single factor. The view is a very attractive one as regards autumn migration from high latitudes: the variation in length of daylight is by far the most constant of the external seasonal changes, and thus apparently the one most capable of correlation with the wonderfully punctual manifestations of the migration habit. The attempt to apply the theory to the spring migration, however, is much less satisfactory. A bird "wintering" on the equator, for example, is subject to constant conditions as regards length of daylight; it surely cannot there be stimulated by the lengthening daylight in its distant summer home. The same remark applies to other seasonal changes, and one thus seems driven back to the physiological explanation—a stimulus arising from the recrudescence of reproductive activity. This recrudescence, it would seem, must in a case where local environmental conditions are irrelevant take place in accordance with a rhythmic physiological cycle, which is related to the sum of the conditions experienced throughout the year. The existence of a periodicity of this kind is also indicated by the fact that some migrants "winter" in the summer of high altitudes in the opposite hemisphere while the birds native there are breeding: they experience two summers, with similar external stimuli acting upon them in each, but breed only in one. In sedentary tropical species, on the other hand, the reproductive cycle is not annual.

It is necessary also to remember that very positive evidence already exists that there is a close relation between the departure of migrants and the incidence of certain meteorological factors. A high barometric pressure is favorable at either season, while a falling temperature is favorable in autumn and a rising temperature in spring, the conjunction of both factors giving the maximum effect. The relevant conditions have been shown to be those, as one would expect, at the starting point of a given journey or part of a journey: unfavorable conditions existing at the point of arrival, as Mr. Eifrig has noted, are not effective. It is prob-

able, however, that these meteorological factors stimulate only in a secondary way, determining the day of flight rather than the time of year. They can scarcely be the primary stimuli, because they do not always lead to migration but do so only at the appropriate seasons: the pressure stimulus, moreover, is the same for northward as for southward migration.

In discussing the causes of migration we have accordingly to consider (a) factors which, without being truly causative, may make migration advantageous and thus give the habit a survival value; (b) factors which may in the past have helped to originate and develop the habit; (c) factors which periodically stimulate the habit to activity at the proper seasons; and (d) factors which may act as secondary stimuli determining the exact time of departure, whether from the winter or summer home or from some intermediate stopping places. My submission is that it is necessary to distinguish clearly in which of these ways any particular factor is being considered as possibly operating, and that to think of the cause of migration as a simple unity would be to ignore the undoubted existence of an inherited habit which has a past as well as a present.

A. LANDBOROUGH THOMSON.

London, England.
July 25, 1924.

A Plea for More Rational Common Names.

Editor of 'The Auk':

I realize that this subject has been often discussed, but an article on Panama birds in the April 'Auk' (Vol. XLI, pp. 304-326, 1924) demonstrates anew our need for a better system of common names for foreign birds. Such designations as "Central American Squirrel-Cuckoo," "Panama Sittasomus," "Hick's Seed-Eater," and "Panama Buff-Throated Saltator"—selected from among many of like kind in the paper before me—will illustrate my meaning. Those who work with Neotropical birds in the field know that no such epithets are ever hurled at them by their human nationals.

Perhaps the manufacturers of these synthetic names will argue that every bird should have an English as well as a Latin name; but should it? North of the Mexican boundary, yes; for here English names are demanded by an ever increasing body of bird-lovers interested in the native avifauna only as birds in the bush, and to whom anything that smacks of scientific nomenclature is distasteful. But the same conditions do not obtain south of our borders. In South America there are no bird-lovers save the naturalists (who need no common names) and those who know birds best by their savor in the pot. And even were bird-lovers legion in our sister republics, English names would be worse than useless to them.

The great majority of Neotropical species have not been given vernacular names because they are unknown to the natives of the countries they

inhabit, and when known at all to English-speaking people they are familiar by their definite scientific names. Should we presume to rectify this condition by coining names unintelligible to inhabitants of the lands where the birds occur? In view of our vigorous protests against some of the names applied by the English to our American birds, I think not.

Dr. Chapman, revolting against these "machine-made" names, went so far as to exclude even vernacular names from his monumental work on the birds of Colombia. I would, however, urge the use of vernacular names whenever they can be obtained, for they are most valuable aids to the field worker. Those given in von Ihering's works helped me greatly when I first began collecting birds in Brazil. For instance, if I sought information regarding *Piaya cayana*, inquiry as to the "Alma de Gato" would surely bring results; but I venture the assertion that Mr. Hallinan never learned anything of this species by asking natives of Panama about the "Central American Squirrel-Cuckoo."

Only field men are in a position to obtain real vernacular names for our tropical American birds and should they make the most of their opportunities perhaps the writers of monographs and check-lists would not feel driven to invent meaningless appellations. Where no vernacular names exist I can see nothing to be gained by vain attempts to supply them from the laboratory, and where they do exist it would seem far more appropriate to use them in their original forms than to translate them, often through a third language, into English. If "Seriema" can find its way unaltered even into our dictionaries why need we draw upon the French for our "Tinamou" and "Toucan"? Is the Tupi "Inhambá" harder to pronounce or the Portuguese "Tucano" less euphonious? And would not even an Aztec name be preferable to "Lawrence's Bent-billed Fly-catcher"?

ERNEST G. HOLT.

312 Bell Building, Montgomery, Ala.

June 2, 1924.

[While we agree in the main with Mr. Holt's argument, there is one phase of the question that he has apparently not considered and that is the necessity for English names for foreign birds and mammals in zoological gardens, public museums and to a certain extent in popular works on natural history. Where Spanish or Aztec names are short and easy of pronunciation they may be adopted by English-speaking people but when it comes to longer names, even "Alma de Gato," they are no better than Latin scientific names for the purposes I have mentioned, and they will not be adopted. Eventually some sort of English name will be proposed for exotic species and it may be better for some person thoroughly familiar with the subject, like Mr. Ridgway in his 'Birds of North and Middle America,' to propose names which those in need may adopt than to leave the matter to some unqualified dealer or publisher. At the same time we are quite as

much opposed as is Mr. Holt to such long-drawn-out names as those which he criticizes (see *antea* p. 495) but where the solution of the problem is to be found we are at a loss to suggest.—W. S.]

NOTES AND NEWS.

MONTAGUE CHAMBERLAIN, a Founder of the American Ornithologists' Union and, since 1901, a Corresponding Fellow, died in Boston, Mass., Feb. 10, 1924, in the 80th year of his age, as a result of a recent fall. He was the son of Samuel M. and Catherine W. (Stevens) Chamberlain, and was born in St. John, N. B., April 5, 1844. He received his education in private schools in his native city and at the age of 14 began work with the firm of J. & W. F. Harrison, wholesale grocers of that city. He served as bookkeeper for 18 years and from 1885 to 1887 was a member of the firm. For 10 years he was an active member of the Canadian army and retired with the rank of captain.

In 1889 he was appointed Assistant Secretary to the Harvard Corporation, being assigned duties now allotted to the Recorder of the University and four years later became Secretary of the Lawrence Scientific School, a position which he held until 1900. He was greatly interested in Indians and in 1899 published a 'Maliseet Vocabulary' and 'The Penobscot Indians,' and in 1904 established a library of a thousand volumes for the Indians at Old Town, Maine. For several years he lived at Groton, Mass., where he devoted his attention to horticulture and specialized in the cultivation of gladiolus in which he was particularly interested. In 1907 he married Miss Anna Sartoris Prout of Petersburg, Va., who died in 1913. After the death of his wife he returned to New Brunswick for a time but his last years were spent in Boston or its vicinity.

Chamberlain's ornithological activity began about 1870 and continued until his retirement from the Lawrence Scientific School. He was elected a Corresponding Member of the Nuttall Ornithological Club in 1881, a Resident Member in 1888, and served as Editor from Dec. 3, 1888 to Jan. 23, 1893. His ornithological publications relate mainly to the birds of Canada and the first, entitled 'Canadian Birds,' appeared in 1870. To the pages of the 'Bulletin of the Nuttall Ornithological Club' and 'The Auk' he contributed a score or more of papers and notes, many of them on the local occurrence or habits of the birds of New Brunswick. Of his other works the most important are: "A Catalogue of the Birds of New Brunswick," published in 1882 in the 'Bulletin of the Natural History Society of New Brunswick;' 'A Catalogue of Canadian Birds,' 1887, a book of 143 pages treating of 556 species; 'Birds of Greenland,' 1891, based on the observations of A. T. Hagerup; a revised version of 'Nuttall's Manual' which went through three editions, 1891, 1896 and 1903 (see 'The Auk,' 1903, p. 314); and a brief account of 'Some Canadian Birds' which ap-

peared in 1895. It is unfortunate that Chamberlain's active interest in ornithology ceased so soon and that during the last twenty years of his life he apparently made no direct contribution to the subject.—T. S. P.

WILLIAM ROBERT OGILVIE-GRANT, a Corresponding Fellow of the Union since 1899, died at his home, Farley Hill Cottage, near Reading, England, July 26, 1924, at the age of 61. He had been an invalid for several years following a stroke of paralysis which he suffered in 1916 while working on the fortifications near London, with the 1st Battalion of the County of London Regiment in which he had enlisted at the beginning of the war.

He was the second son of George H. E. Ogilvie-Grant and Eleanora, a daughter of Sir William Gordon Cumming and was born Mar. 25, 1863, at Easter Elchies, Morayshire, Scotland. His education was received at Cargilfield and Fettes College, Edinburgh, and at the age of 19 he entered the service of the British Museum where he remained 36 years. He received an appointment as Assistant 2nd Class in the Zoological Department in 1882 and began work on fishes under Dr. Günther, but soon after the removal of the Natural history collections to South Kensington he was transferred to the ornithological section. During the temporary absence of Dr. Sharpe in India in 1895 he was placed in charge of the birds. He served as Asst. keeper of the Zoological Department from 1913 to 1918 when, on account of ill health, he was obliged to give up active work and retire to the country. In 1890 he married Maud Louisa, eldest daughter of Vice Admiral Mark Pechell, who, with a son and three daughters, is still living.

Ogilvie-Grant cooperated actively with Dr. Sharpe in building up the great collection of birds in the Museum and from time to time found opportunity to make collecting trips to localities of special interest. He visited the Orkney, Shetland and Canary Islands, Madeira, Arabia, Sokotra, and Abd-el-Kuri. He also took an active part in raising funds and organizing several scientific expeditions of which those to Ruwenzori, Snow Mountains, and the interior of New Guinea were the most important.

He was a voluminous writer and published many systematic papers in the various zoological journals. He was the author of the volume on 'Game Birds,' of the 'British Museum Catalogue of Birds' and wrote parts of two other volumes. He was also author of the 'Handbook of Game Birds' in Allen's Naturalists' Library, 'Gun at Home and Abroad,' 'Guide to the Gallery of Birds in the British Museum,' 'British Game Birds and Wild Fowl,' 'Birds of the Ruwenzori Expedition,' 'Rept. of the B. O. U. Expedition to New Guinea,' a series of 9 papers on birds of the Philippines and many other reports on special collections of birds. He edited the Migration reports of the British Ornithologists' Club for 1907-12, the 'Bulletin' of the Club from 1904 to 1914 and the 'Index to Sharpe's Hand List of Birds.'

Among the many new birds which he described two of the most striking are, the Monkey-eating Eagle (*Pithecopaga jeffreyi*) of the Philippines,

based on a specimen collected by Whitehead in the island of Samar, and the Mikado Pheasant (*Calophasis mikado*), obtained by Goodfellow in central Formosa. The latter species was based on two tailfeathers from Mount Arizan and several years elapsed before complete specimens were collected in the same region. But among all the new forms very few were described as subspecies for Ogilvie-Grant was not a trinomialist and his views on species differed considerably from those of certain other ornithologists.

His studies of game birds led him to take an active interest in the plumage changes of native Grouse and Partridges and in the investigation in Grouse disease. Bird protection and conservation also claimed much of his attention and he served on the Council of the Royal Society for the Protection of Birds and was one of the founders of the Society for the Promotion of Nature Reserves. When a complete bibliography of his works is published it will show not only the extent of his activities but also the wide range of his interests.—T. S. P.

PROF. DEAN CONANT WORCESTER, a Corresponding Fellow of the Union since 1903, died of heart disease at St. Luke's Hospital in Manila, P. I., May 2, 1924, in the 58th year of his age. He was the son of Ezra Carter and Ellen H. Worcester and was born in Thetford, Vt., Oct. 1, 1866. He was educated at the University of Michigan where he received the degrees of A.B. in 1889 and D.Sc. in 1915, and where he served as Assistant in Botany 1889-90, Instructor in Animal Morphology 1893-94, Assistant Professor 1894-95, and Assistant Professor of Zoology and Curator of the Zoological Museum 1895-99. His scientific career began at the age of 21, while still an undergraduate student, with his appointment as a member of the Steere Expedition to the Philippines in 1887-88. Later, in 1890-93, he took part in the management of the Menage Expedition to the Philippines. On his return he was married, April 27, 1893, to Miss Nanon Fay Leas, of Pasadena, Calif.

At the close of the war with Spain he was one of the few men in the United States who had any personal knowledge of conditions in the Philippine Islands and it was only natural that he received from President McKinley an appointment as a member of the U. S.-Philippine Commission on which he served from Jan. 1899 to Sept. 1901. His service continued until he was appointed Secretary of the Interior under the Insular Government, a position which he held for the twelve years from Sept. 1, 1901 to Sept. 15, 1913. After his retirement from official service he made his home on the island of Cebu and became vice president and general manager of the Agusan Coconut Co., assistant to the president of the Philippine Refining Corporation and president of the Philippine Dried Coconut Corporation.

As a result of his two early expeditions he published with Dr. F. S. Bourns two important papers on the birds of the islands. One on the 'Birds and Mammals collected by the Menage Scientific Expedition,'

appeared in the 'Occasional Papers of the Minnesota Academy of Natural Sciences' in 1894, and the other on 'Contributions to Philippine Ornithology' in the 'Proceedings of the U. S. National Museum' in 1898. He always maintained his interest in this branch of zoology and a few years later was co-author with R. C. McGregor in a 'Hand List of the Birds of the Philippine Islands' issued in 1906. In addition to various articles which he published on the islands and their fauna he was the author of several comprehensive general works including 'The Philippine Islands and their People,' 1899; 'The Non-Christian Tribes of Northern Luzon,' 1906; and 'The Philippines Past and Present,' 1913. His greatest contribution to scientific work was his active interest and support of the Bureau of Science under which much important field work and research has been carried on in ornithology, botany and other branches of natural science.

Prof. Worcester had the distinction, unique among ornithologists, of gaining knowledge while still a young field collector which resulted later in his return to the scene of his early activities as a member of the Insular Commission and a Cabinet officer. During his term of office as Secretary of the Interior he was responsible in large part for the establishment of the Bureau of Science, the Ethnological Survey, and the Philippine General Hospital and College of Medicine, which stand as monuments of his energy, his broad vision in scientific research and his deep interest in human welfare. Two days after his death Governor-General Wood issued a statement in which he declared: "Dean C. Worcester will always be known as a great builder, working with an eye single to the welfare of the people and country in which he lived. He will always be an outstanding figure in the history of the Philippines."—T. S. P.

CHARLES CHUBB, a Corresponding Fellow of the American Ornithologists' Union since 1911, died at St. George's Hospital, London, England, June 25, 1924 in the 73rd year of his age. His death was the result of an automobile accident. As he was leaving the Natural History Museum on June 11, he was knocked down by a passing motor car and succumbed two weeks later without having fully regained consciousness. The following biographical details have been kindly furnished by Dr. Casey A. Wood and Mr. W. L. Schlater.

Charles Chubb, the son of William and Thurza Chubb, was born at Steeple Langford, near Salisbury, Wiltshire, England, Dec. 31, 1851. His education was received at the National School at Langford, and at the age of 26 he entered the service of the British Museum. He received an appointment, Aug. 21, 1877 as Attendant of the Second Class in the British Museum (Bloomsbury); 31 years later, July 9, 1908, was made Departmental Clerk; and on June 20, 1920, was retired but continued to work in the Bird Room of the Natural History Department until the day of the accident. He married first in 1881 Ada Albion of Forestgate by whom he had five children and second in 1912 Alice Mabel Baker of Fullam by

whom he had two children. One of his sons, E. C. Chubb, is now curator of the Museum at Durban in Natal, South Africa.

Mr. Chubb was a member of the British Ornithologists' Union and a Fellow of the Zoological Society of London. When the natural history collections were moved from Bloomsbury to South Kensington, he became associated with Dr. R. Bowdler Sharpe and continued as his assistant for a quarter of a century. During this time he published little and apparently was known to few ornithologists except those who had occasion to visit the bird collection in the Museum. In his 'History of the Collections of the British Museum' (Vol. II, p. 329, 1906) Dr. Sharpe thus acknowledges his indebtedness to his assistant: "By incessant work inside the Museum and by devoting all his private time to the study of birds, he (Chubb) has acquired a knowledge of the class *Aves* which has been of the greatest assistance to myself and ornithologists visiting the Museum, while his knowledge of ornithological literature is probably unrivalled. He has been of the greatest help to me in the preparation of the concluding volumes of the 'Catalogue of Birds' and has assisted me materially for several years in the compilation of the 'Zoological Record.'"

Prior to the death of Dr. Sharpe in 1909, Chubb published comparatively little in his own name except a 'Synopsis and Index' of the eleven volumes of 'Stray Feathers' and lists of the birds of Liberia and Uganda in Sir Harry Johnston's great works on those countries. During the last fifteen years his publications have included several important works. Among these may be mentioned a bibliography of R. Bowdler Sharpe and a biographical sketch of F. V. McConnell in the 'Bulletin of the British Ornithologists' Club;' descriptions of a number of new species of birds chiefly from South America; a paper 'On the Birds of Paraguay,' 1910, and 'Notes on Collections of Birds from Ecuador, Peru, Bolivia and Argentina,' 1919, contributed to 'The Ibis;' and a work in two volumes on 'The Birds of British Guiana,' 1916-21, based on the collections of F. V. McConnell. With Dr. Sharpe he published 'Notes on a Collection of Birds from Sandakan, N. E. Borneo,' in 'Ornis' in 1909 and with Lord Brabourne he projected an ambitious work on the 'Birds of South America' of which only a single volume containing a check-list of 4561 species appeared in 1912. On account of the death of both authors this work unfortunately is likely to remain incomplete.

Chubb apparently was one of those quiet, modest workers whose knowledge of his subject was ever at the disposal of others and whose chief contribution to science should be measured by service rather than publication. It is only fitting that several species of birds and the genus *Chubbia* Mathews, 1913, have been named in his honor and that the Imperial Service Medal was awarded to him for long and faithful service.—T. S. P.

LUMAN J. HERSEY died at his home at Wray, Colorado, on January 27, 1924. Mr. Hersey was for many years prominent in ornithological work in Colorado, where he was known not only as a bird student of much

acumen, but also as an enthusiastic devotee of the sport of wild-fowl shooting. He was for several years curator of ornithology and mammalogy at the Colorado Museum of Natural History in Denver, resigning his position at that institution in the fall of 1913, when he retired to his ranch at Wray, Colorado.

He was elected an associate of the American Ornithologists' Union in 1909, continuing his membership until 1916. Although his principal contributions were submitted to 'The Condor,' he nevertheless published in the pages of 'The Auk' several notes on Colorado birds, mainly on species new to the avifauna of that State.—F. C. L.

THE DUPONT DE NEMOURS POWDER COMPANY continues its campaign against the Crow and unfortunately is receiving support from various sportsmen's associations and some State Game Commissions which are unacquainted with the true nature of the problem. Some of the "evidence" published broadcast is extremely amusing to anyone experienced in weighing evidence. We all agree that Crows and other birds which actually destroy crops or game should be killed where committing these outrages but the attempt to *exterminate* any species can only result in harm, and should not for a moment be considered. Much of the Powder Company's data is derived from Pennsylvania and yet the State Conservation Council at its annual meeting at State College in May last unanimously adopted a resolution that the killing of any species of bird regarded as vermin should be relegated absolutely to the State Game Commission and that they go on record as opposed to any plan for the extermination of a species backed by commercial interests. In Australia where the Crow has been similarly condemned, it has recently established itself as the most effective enemy of the blowfly which has spread over the country and so it will be here; no one can foretell at what moment we may be overrun with some pest against which the Crow will be the only efficient check.

Crows are not so numerous now as formerly nor are they doing so much harm and it is deplorable that those concerned with conservation should be led astray by commercial interests or by their agents, whose object is directly or indirectly to increase the sale of ammunition. Let us rely on the opinion of the U. S. Biological Survey, the National Association of Audubon Societies and the Pennsylvania Council, all of which are opposed to the extermination campaign and have back of them evidence and facts based on many years of investigations that the Crow does as much good as harm.

THE INTERNATIONAL COMMITTEE FOR BIRD PROTECTION (British Section) has issued a little pamphlet explaining its objects and setting forth its rules. The protection of Flamingoes on the Bahamas and of Penguins on Macquarie Island and the abatement of the oil menace on the sea shores are matters receiving attention at the present time.

THE SUMMER NUMBER of 'Bird Notes and News' shows what splendid work the Royal Society for the Protection of Birds is accomplishing. The Society should receive the support of all interested in bird conservation. Their quarterly publication to be had for 2s. 6d. per annum keeps one posted on all that is being done across the water on behalf of the birds. Address 82 Victoria St., S. W. 1, London, England.

THE BIRD CLUBS, Audubon Societies and Bird Banding Organizations of New England have organized a "Federation of the Bird Clubs of New England" with Edward H. Forbush as president, their object being to promote all interests connected with bird conservation and study, and to increase their membership. A circular of information and the By-Laws of the organization have been published; Lawrence B. Fletcher, Brookline, Mass., is the Secretary.

WHELDON & WESLEY, 2, 3 and 4 Arthur St., New Oxford St., London, W. C. 2, are about to publish 'A Monograph of the Birds of Prey,' by H. Kirke Swann. The work is to consist of 12 quarto parts each with four colored plates in addition to photogravures. The price will be 26 shillings net per part. The edition will be limited to 412 copies and Part I will be ready November 15, 1924.

WE again call the attention of all members of the Union to the approaching meeting at Pittsburgh, November 11-13, of which a notice was published on pp. 514-515 of the July 'Auk.' It is none too soon to make arrangements to be present. The Union is particularly anxious to have as many members present as possible, especially those who have not previously attended meetings, as the success of our Society depends upon the interest and coöperation of every member. The usual notice from the Secretary, giving all particulars, will shortly be mailed.

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ERRATA.

Page 163, line 4, for "troille," read troile.

" 308, line 41, for "martinica," read martinicus.

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DR. WITMER STONE,

ACADEMY OF NATURAL SCIENCES,
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MEETINGS OF THE A. O. U.

Since its organization in 1883 the American Ornithologists' Union has held one special and 41 annual meetings.

Meeting	Date	Place	Fellows Present	Total Membership
1	1883, Sept. 26-28	1st New York	21	23
2	1884, Sept. 30-Oct. 2	2d New York	16	143
3	1885, Nov. 17-18	3d New York	16	201
4	1886, Nov. 16-18	1st Washington	20	251
5	1887, Oct. 11-13	1st Boston	17	284
6	1888, Nov. 13-15	2d Washington	20	298
7	1889, Nov. 12-15	4th New York	20	400
8	1890, Nov. 18-20	3d Washington	20	465
9	1891, Nov. 17-19	5th New York	14	493
10	1892, Nov. 15-17	4th Washington	20	557
11	1893, Nov. 20-23	2d Cambridge	7	582
12	1894, Nov. 12-15	6th New York	15	616
13	1895, Nov. 11-14	5th Washington	19	667
14	1896, Nov. 9-12	3d Cambridge	14	673
15	1897, Nov. 8-11	7th New York	18	679
16	1898, Nov. 14-17	6th Washington	21	695
17	1899, Nov. 13-16	1st Philadelphia	16	744
18	1900, Nov. 12-15	4th Cambridge	19	748
19	1901, Nov. 11-14	8th New York	18	738
20	1902, Nov. 17-20	7th Washington	25	753
20a	1903, May 15-16	1st San Francisco	7	—
21	1903, Nov. 16-19	2d Philadelphia	19	775
22	1904, Nov. 28-Dec. 1	5th Cambridge	17	808
23	1905, Nov. 13-16	9th New York	17	860
24	1906, Nov. 12-15	8th Washington	24	750
25	1907, Dec. 9-12	3d Philadelphia	20	850
26	1908, Nov. 16-19	6th Cambridge	17	888
27	1909, Dec. 6-9	10th New York	19	866
28	1910, Nov. 14-17	9th Washington	23	897
29	1911, Nov. 13-16	4th Philadelphia	18	887
30	1912, Nov. 11-14	7th Cambridge	18	929
31	1913, Nov. 10-13	11th New York	28	992
32	1914, Apr. 6-9	10th Washington	27	1101
33	1915, May 17-20	2d San Francisco	11	1156
34	1916, Nov. 13-16	5th Philadelphia	26	830
35	1917, Nov. 12-15	8th Cambridge	21	891
36	1918, Nov. 11	12th New York	14	953
37	1919, Nov. 10-13	13th New York	28	1024
38	1920, Nov. 8-11	11th Washington	25	1142
39	1921, Nov. 7-10	6th Philadelphia	25	1351
40	1922, Oct. 23-27	1st Chicago	24	1457
41	1923, Oct. 8-12	9th Cambridge	25	1652

The next regular meeting—the 42d Stated—will be held at Pittsburgh, Pa., November 10-13, 1924.

